OP-ED CONTRIBUTOR

When Safety Costs Too Much

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In defending against disasters, society plays a complicated game against nature that has unclear rules and high stakes. Still, we improve our odds of surviving earthquakes, floods and hurricanes by carefully choosing how and where we build. For example, last month's earthquake in Iran - where lax construction standards mean that buildings collapse even without natural disasters - killed more than 30,000 people. But earthquakes of similar strength in California, which has strict rules, cause far fewer deaths (last month's earthquake there killed two people, and even the slightly stronger 1994 Northridge earthquake, in a densely settled area of Los Angeles, killed only 61 people).

Surely, then, it would be best for people in areas around seismically active faults to choose the most earthquake-resistant construction available. Not necessarily. Certainly, construction standards that are too weak will result in death and destruction, as demonstrated by recent disasters in India and Armenia, as well as Iran, whereas low fatality rates in California show the value of strict standards. More isn't always better, however. In areas that are considerably less at risk for a major earthquake, standards that are too stringent may divert money from other health and safety measures that would save more lives. The wiser course, in a world of limited resources, is to not apply blanket rules but to carefully develop standards for specific regions that balance costs and benefits.

Consider the case of Memphis and other communities within the New Madrid seismic zone, which covers an area of more than 100,000 square miles, including parts of Arkansas, Illinois, Indiana, Kentucky, Mississippi, Missouri and Tennessee. Earthquakes there are typically more a nuisance than a catastrophe: the largest in the past century, a magnitude 5.5 earthquake in 1968, knocked down log cabins but caused no fatalities. A series of major earthquakes, the biggest of which seismologists now say probably had a magnitude around 7.3, did occur near New Madrid, Mo., in 1811 and 1812, before there was much settlement. But such strong earthquakes come only every 500 years or so, far less often than in California. As far as we know, no one has ever died in an earthquake in the New Madrid zone.

Yet the Federal Emergency Management Agency is pushing cities and states in the seismic zone to strengthen construction standards to levels comparable to California's. Such earthquake codes require builders to use techniques that allow structures to flex without breaking when the ground shakes, but for a much bigger range of motion than Memphis is likely to experience during the life of its buildings. FEMA documents indicate that this is being proposed with almost no consideration of costs and benefits, even though we estimate the earthquake risk in the New Madrid zone to be one-tenth to one-third that of California's.

Our back-of-the envelope estimates illustrate the new code's costs and benefits: over its approximately 50-year life, a building in Memphis loses about 1 percent of its value because of earthquakes, while the new code could increase a building's cost 5 percent to 10 percent. FEMA's recommendation to retrofit hospitals, highways, bridges and other structures adds more costs. For example, retrofitting the Memphis Veterans' Hospital (federal buildings automatically follow FEMA guidelines) cost about $100 million, comparable to the cost of a new building.

The tradeoffs are high. Money spent strengthening schools isn't available for teachers' salaries, upgrading hospitals may mean treating fewer uninsured patients, and stronger bridges may result in hiring fewer police officers. The proposed code may over time save a few lives per year, while the same money invested in health or safety measures (flu shots, defibrillators, highway upgrades) could save many more.

The same is true for other natural disasters. For example, after Hurricane Andrew, Florida adopted a building code that significantly increases the hurricane resistance of structures. This adds thousands of dollars to the costs of building a house, for instance, but makes sense because of the state's history. Whether such standards make sense for Long Island, New Jersey, or other coastal areas that experience hurricanes less frequently depends on whether the increased costs yield commensurate benefits.

Some officials in the New Madrid zone, including those in Memphis, are resisting FEMA's push for states and cities to adopt the agency's guidelines. But not surprisingly, other municipalities in an area with little experience of earthquakes are putting their trust in FEMA, the government's authority on managing natural disasters.

In this case, as in many others involving safety and health, we might be able to save a lot of money without risking lives. An objective assessment by outside analysts, perhaps sponsored by the National Academy of Sciences, could realistically estimate the hazard and the costs and benefits of various earthquake codes. For example, many of the codes already in place in the New Madrid seismic area may make sense. Or it may turn out that standards closer to California's are warranted. Given the large sums at stake, time spent getting things right would be well spent.

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