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IDEAS

Expect the worst

Disasters happen, so we might as well prepare for them

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As unnerving as it is, most people spend at least some time imagining the worst thing that could happen to them. Those who dwell on such imaginings are called paranoid. But having the thoughts, and controlling them or perhaps even working them into a plan, is considered intelligent and wise.

When you buy life insurance, for example, you're preparing for the worst case for your family, and we call that responsible. We consider it irresponsible that American intelligence agencies were caught off guard by the terrorist attacks of Sept. 11, 2001. They failed to prepare for a devastating worst case.

Thinking about worst cases is a habit worth getting into. It brings us to several surprising conclusions. One is that things we think of as rare aren't. Disaster is as normal as love, joy, sorrow and divorce. There are good reasons not to be surprised by the unexpected.

In August 1998, Andres Perez was testing his new .22 rifle at his home in Brentwood. He pointed the gun into the sky and fired. Some moments later Christina Dellaratta, who was sunbathing in her backyard almost a mile away, felt a sting. She thought it was a mosquito bite, but it was much worse. Doctors were able to remove Perez's slug from Dellaratta's abdomen, and he was charged with reckless endangerment and assault. It was the kind of thing people say can't happen in a million years.

In 1992, a Boeing 747 was taking off in the Netherlands when an engine fell off, taking another with it. The 400-ton plane sheared the top five floors from two buildings and exploded in a fireball. The plane also happened to be carrying most of the chemicals needed to make Sarin nerve gas, as well as some depleted uranium as a counterweight. The risk of such a confluence of events is, the experts say, vanishingly small. But it happened.

The tsunami of last December, which killed perhaps 200,000 people, actually was predictable; it happened in one of the most earthquake-prone regions in the world. But even experts couldn't predict that it would wreak havoc 3,000 miles away in Africa. What might happen should a powerful tsunami start 100 miles east of Atlantic City? It's not likely, but scientists say it could happen.

How much should we worry about such unlikely occurances? We can't live life on the razor's edge of fear. Still,

a colleague of mine put it well when he said things that have never happened before happen all the time.

The usual approach to risk ignores that astute observation. It counsels probabilistic thinking, which means making decisions about risk according to what is most likely to happen. Airline pilots think this way when they say, after a long and bumpy flight, that you've just completed the safest part of your trip.

Worst-case thinking is possibilistic thinking, which means preparing for consequences should the unlikely actually happen. Airline passengers think like this when they're at 30,000 feet and the plane starts bumping. They're not thinking about the overall safety record of airline travel. They're thinking what might happen if their plane has a particularly bad day.

Notice that both pilots and passengers are being sensible, but in different ways. Pilots have been trained for conditions much rougher than air bumps, and they know the odds are in their favor. Passengers also know that, but they're worrying if the odds will go against them.

In myriad ways, probabilistic and possibilistic thinking shape our response to the dilemmas we face. Recall the Shoreham nuclear power plant. Before it was shut, the U.S. Department of Energy and Long Island Lighting Co. argued the chances of Shoreham melting down were very, very small. They were right. But many Long Islanders worried about vast expanses turning into wasteland should the unlikely occur. They were right, too.

In daily life, we constantly use both probabilistic and possibilistic approaches. We use seat belts and air bags in our cars, even though neither do anything to lessen the likelihood of an accident. They do, however, lessen the consequences if an accident happens. Parents worry about school shootings, even though the probability of such a thing is low. Losing a child is too horrendous not to contemplate.

Many policy makers and intellectuals say the only way to approach risk is through probability. It is too expensive, they say, to waste resources on minor risks and become hysterical about dramatic hazards. Yet if we rely only on statistical probabilities, we'll never be prepared enough for the next disaster.

Where will the worst happen? I worry about terrorists with weapons of mass destruction, bird-flu ravaging the world's population, about mad cow disease, and a little about asteroids.

And there are more prosaic threats. We need to fear our trains. They fall off tracks, slam into each other or cars and trucks. They are an excellent terrorist target, as the March 2004 attack in Madrid showed. It is on trains, by and large, that the United States ships its hazardous materials.

One of the scariest cases is the Baltimore tunnel fire of July 2001. This was the kind of accident that officials say is too extreme to worry about. The train was carrying hydrochloric acid, among other chemicals, along with several cars of pulp material. It all made for a fire that slowed down part of the Internet, disrupted telephone service, and caused all major highways into the city to be closed to incoming traffic. A light gray haze drifted over much of central Baltimore, canceling a baseball game at Camden Yards. Weeks later, a combustible chemical suspected of coming from the train appeared in city sewers. A 40-inch water main above the tunnel broke, flooding some streets, collapsing others and knocking out electricity.

Imagine if a single rail car, which can carry 90 tons of chlorine, had been on the train and ruptured in the tunnel. One and a half million people could have been at risk. CSX reports that 40 freight trains run through Baltimore on an average day; some days, all carry hazardous materials. Even more frightening is the U.S. Nuclear

Regulatory Commission's rule for transporting nuclear waste: Containers must withstand 1,475 degrees for 30 minutes. Conservative estimates are the tunnel fire burned at 1,500 degrees for 24 hours.

So why do smart people say probabilism is the only way to go? Partly because we are wedded to the idea that costs must be justified by benefits. But notice that nobody says it's silly to put containment shells around nuclear power plants or that we shouldn't continue to spend money refining airplane safety, even though disasters are extremely rare in either case.

Probably the biggest obstacle to possibilistic thinking is that we can't see a way to incorporate it into our daily lives. How do we avoid becoming paralyzed by the thought of all that might go wrong whenever we go on a date, drive a car or just sunbathe in the backyard?

There is no magical formula, but there are a few guidelines. Historians and political scientists have developed rules for the wise use of "counterfactuals" - hypothetical scenarios of events that might have been.

We also can use the "precautionary principle." This concept has been misrepresented as a radical brake on development, but all it demands is caution: If an activity might pose severe damage to human health or the environment, we ought to consider the consequences, without necessarily waiting for proof.

On the family level, we can have home disaster plans. It's not that hard to prepare to be isolated at home for three days without electricity. We can work with schools to figure out what happens to the kids if another 9/11 strikes. The act of planning together can facilitate quick responses. Disaster and fear will always be with us. So will hope and joy. We would be wiser, and safer, to prepare for both.