

## RISK LITERACY

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Literacy is the precondition for an informed citizenship in a participatory democracy. But knowing how to read and write is no longer enough. The breakneck speed of technological innovation has made risk literacy as indispensable in the twenty-first century as reading and writing were in the twentieth. Risk literacy is the ability to deal with uncertainties in an informed way.

Without it, people jeopardize their health and money and can be manipulated into experiencing unwarranted, even damaging, hopes and fears. Yet when considering how to deal with modern threats, policy makers rarely ever invoke the concept of risk literacy in the general public. To reduce the chances of another financial crisis, proposals called for stricter laws, smaller banks, reduced bonuses, lower leverage ratios, less short-termism, and other measures. But one crucial idea was missing: helping the public better understand financial risk. For instance, many of the NINJAs (No Income, No Job, No Assets) who lost everything but the shirts on their backs in the subprime crisis hadn't realized that their mortgages were variable, not fixed-rate.

Another serious problem that risk literacy can help solve is the exploding cost of health care. Tax hikes or rationed care are often presented as the only viable solutions. Yet by promoting health literacy in patients, better care can be had for less money. For instance, many parents are unaware that a million U.S. children have unnecessary CT scans annually, and that a full-body scan

can deliver a thousand times the radiation dose of a mammogram, resulting in an estimated twenty-nine thousand cancers per year.

I believe that the answer to modern crises is not simply more laws, more bureaucracy, or more money, but, first and foremost, more citizens who are risk-literate. This can be achieved by cultivating statistical thinking.

Simply stated, statistical thinking is the ability to understand and critically evaluate uncertainties and risks. Yet 76 percent of U.S. adults and 54 percent of Germans do not know how to express a 1 in 1,000 chance as a percentage (0.1 percent). Schools spend most of their time teaching children the mathematics of certainty—geometry, trigonometry—and little if any time on the mathematics of uncertainty. If taught at all, it is mostly in the form of coin and dice problems that tend to bore young students to death. But statistical thinking could be taught as the art of real-world problem solving—i.e., the risks of drinking, AIDS, pregnancy, skateboarding, and other dangerous things. Out of all mathematical disciplines, statistical thinking connects most directly to a teenager's world.

At the university level, law and medical students are rarely taught statistical thinking, even though they are pursuing professions whose very nature it is to deal with matters of uncertainty. U.S. judges and lawyers have been confused by DNA statistics; their British colleagues have drawn incorrect conclusions about the probability of recurring sudden infant death. Many doctors worldwide misunderstand the likelihood that a patient has cancer after a positive screening test, or can't critically evaluate new evidence presented in medical journals. Experts without risk-literacy skills are part of the problem rather than the solution.

Unlike basic literacy, risk literacy requires emotional rewiring—rejecting comforting paternalism and illusions of certainty and learning to take responsibility and to live with uncertainty.

Daring to know. But there is still a long way to go. Studies indicate that most patients want to believe in their doctor's omniscience and don't dare to ask for supporting evidence, yet nevertheless feel well-informed after consultations. Similarly, even after the banking crisis, many customers still blindly trust their financial advisors, jeopardizing their fortunes in a consultation that takes less time than they'd spend watching a football game. Many people cling to the belief that others can predict the future and pay fortune-tellers for illusory certainty. Every fall, renowned financial institutions forecast next year's Dow and dollar exchange rate, even though their track record is hardly better than chance. We pay \$200 billion yearly to a forecasting industry that delivers mostly erroneous future predictions.

Educators and politicians alike should realize that risk literacy is a vital topic for the twenty-first century. Rather than being nudged into doing what experts believe is right, people should be encouraged and equipped to make informed decisions for themselves. Risk literacy should be taught beginning in elementary school. Let's dare to know—risks and responsibilities are chances to be taken, not avoided.