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Terrorism and Bathtubs

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We have nothing to fear except maybe bathtubs, apparently. Or perhaps, those who ignore mathematics are condemned to repeat false assertions.

> "One's chance of being killed in a terrorist attack is many times less than one's chance of drowning in a bathtub or being killed by a fall from scaffolding or a ladder." Cato Institute's Handbook for Congress.

> "... it is worth remembering that the total number of people killed since 9/11 by Al Qaeda or Qaeda-like operatives outside of Afghanistan and Iraq is not much higher than the number who drown in bathtubs in the United States in a single year, and that the lifetime chance of an American being killed by international terrorism is about one in 80,000 -- about the same chance of being killed by a comet or a meteor." John Mueller, a political scientist at Ohio State University and the author of *Overblown: How Politicians, the Terrorism Industry and Others Stoke National Security Fears*.

> "... the danger of dying in a bathtub, for example, is greater than from a terrorist attack." Barry Glassner, professor of sociology at the University of Southern California and the author of "The Culture of Fear."

> "In the year 2000, your chance as an American of being killed in a terrorist attack in the United States was exactly zero. In 2002, your chance of dying in a terrorist incident was, again, ZERO. And in 2003, as of this writing, the total number of people to die in the United States from acts of terror? Zero. Even in the tragic year of 2001, your chance as an American of dying in an act of terrorism in this country was 1 in 100,000." Michael Moore, in his book "Dude, Where's my Country."

> To stipulate, 344 people drowned in bathtubs in 2005, and 477 died by falling from a ladder or scaffolding. Since there were about 297 million people in the US in 2005, the odds of dying by falling from a ladder or scaffolding were one in 621,608 for example, according to the National Safety Council.

> The number of people killed by nuclear bombs in the US in 2000: zero. In 2002: ZERO. In 2001: also zero. In fact, I looked it up for all years in the US going back to 1776, and it was zero every single year.

> Therefore we should not fear nuclear war at all -- zero, zip, nada. Concerned scientists can put their clocks away. We can rip up all those anti-proliferation treaties.

> What's wrong with this analysis? Multiple things.

> In Michael Moore's case, he needs to be told that "chances" have to do with future events. Speaking of the "chance" of something happening to you years ago is meaningless nonsense. My "chance" of dying in 2001, by any means you care to name, is now zero -- for the simple reason that I didn't die then. The trick is to predict chances about the *future*.

> Secondly, Moore et al completely ignored preventive measures. The reason so few people die from snake bites (only seven in the US in 2005) might very well be due to our "irrational" fear of snakes and the extra precautions we therefore take with them. Same for terrorism. You think no one would have died in 2002 or 2003 from terrorist attacks in the US if we had done nothing to prevent them?

> Third, and most importantly, Moore et al ignored what investment advisors are required to tell us: past performance does not guarantee future results. If we calculate odds the way Michael Moore et al do, i.e., counting past occurrences and dividing by the population and time period over which they occurred, the probability of any *new* way of dying would be zero. If no one ever died from X before, the chances of dying

from X in the future is zero.

Many of these people lecturing us about how stupid we are in comprehending probability, presented seriously flawed mathematical analyses themselves. The theory of estimating a probability from physical observations is called "statistics". Statistics require there first be some physical observations. And without some understanding of the underlying physical mechanism, even several observations are of little or no use.

Take dice. If you did not even have an idea of how many sides a die has, you would have no idea of the probability of any particular outcome. How many sides does terrorism have?

Even if you knew how many sides on a die, but nothing else, you could not assume each side is as likely to turn up as any other side. To estimate that, you'd have to roll the die several times for as many sides as it has. *Lots* of times. Even then, how would you know the die would be consistent over time? What if the "numbers" were crawling bugs on a jello die instead of dents in hard plastic?

These simple examples reveal that certain *assumptions* must be made about a physical process before it can be modeled by the mathematics of probability. Have you ever heard of the assumption of ergodicity, for example? What about statistical independence and time invariance? Those must be the characteristics of a stochastic process in order to make estimates using simple calculations like frequency of occurrence over time.

Try proving that terrorism, as a stochastic process, is ergodic, for example. If you can't prove it, or at least make a reasonable case to assume it, then your calculations are for naught. If you have no idea what terms such as "stochastic", "time invariant" and "ergodic" mean, I suggest you be more bashful in your public claims about "chances."

These assumptions undergirding probability theory have to do with the *natural* world. But terrorism and nuclear war are acts of *man* -- thinking, motivated and zealous men. (One might even call them "man-caused disasters".) Believe it or not, men occasionally do what has never been done before. Have you heard of copyrights and patents?

Before the US dropped atomic bombs on Japan, the "chance" of dying from an atom bomb was absolutely zero in Michael Moore Calculus. Tell that to those going about their daily routines in Hiroshima and Nagasaki in 1945.

In fact, the "probabilities" go the wrong way. If history tells us anything, it is that humans will kill each other, in small numbers and large, by ever more ingenious methods. Catapults in one era, iron maidens, Zyclon B, nuclear bombs and box-cutters on airplanes in others.

Advanced technology is not always necessary. Machetes came in pretty handy in Rwanda a few years ago. But now the technology is also there. Pakistan has nuclear warheads. North Korea has tested some, too. Saddam Hussein had chemical and biological weapons and programs. (Yes, he did. The only doubts were how ready-to-go they were in March 2003.) I'm thinking Iran's interest in nuclear technology is not just about powering light bulbs and television sets.

For you political science and sociology professors, non-documentary documentary makers, and other stochastic process experts, please answer some of these other probability questions.

- Nine countries developed nuclear weapons in the last seven decades. What are the chances that a few more countries will in the next decade or two? What are the chances that such a country would be an enemy of the U.S.?
- Iran uses groups such as Hezbollah and Hamas to further its policy goals. Those groups, in turn, fired 4,048 rockets and 4,040 mortar shells into Israel between 2001 and 2008. What are the chances those groups would use more lethal weapons in more places of the world to kill Americans and Jews if they had the capability?
- The Rand data base contains over 36,000 terrorist incidents since 1972. What are the chances terrorist incidents would become more lethal if terrorists had the technology for it?
- In the last 70 years, the U.S. has let its defense spending slip below 4% of GDP twice. The first time, Japan attacked Pearl Harbor. The second time, terrorists attacked New York and Washington, D.C. What are the chances that if defense spending goes below 4% of GDP again, nothing bad will happen to us?
- Abdul Qadeer Khan helped Pakistan develop nuclear weapons (to the surprise of our CIA) and was

involved with selling nuclear secrets to Iran, North Korea and Libya. Pakistan recently released him from custody. What are the chances that he will help those countries, other countries, or jihadists develop or obtain nuclear weaponry, especially if we ignore him? Is it OK to track his cell phone, even if the call is to or from the U.S.?

- What are the chances that there is no one else like Khan, especially given that Adlene Hicheur, a Stanford trained physicist working at the world's largest atom smasher, was recently charged with ties to al Qaida?
- Pakistan already has the bomb. The Pakistani government that first cooperated with us in the War on Terror after 9/11 is no longer in power. The government that is in power released Khan and has an intelligence service riddled with al Qaida and Taliban sympathizers. What are the chances none of its nuclear warheads will fall into terrorists' hands, especially if we remove our troops from the area?
- France surrendered to the Nazis in 1940. It refused US overflight clearance to deal with Libya in 1986. It helped the Hutus commit genocide in Rwanda in the 1990s. It refused to cooperate with the U.S. against Saddam Hussein in 2002. Its former President's son, Jean-Christophe Mitterrand, was arrested in 2000 for illegal arms deals. Its greatest military victory in the last 90 years was sinking Greenpeace's *Rainbow Warrior*. What are the chances we can rely on France to contain nascent nuclear powers? What about the chances we can rely on the UN?

We can make nonsense probability calculations and treat terrorism as a low-probability, low casualty rate, criminal matter. Or we can treat it as a serious matter of national defense.

If we treat it as a police matter, where would you suggest the chalk outline go after the first biological warfare attack?

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