Your covid-19 risk: How to navigate this new world of uncertainty

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Baffling statistics and their impact on our emotions can make it hard to evaluate risk in this pandemic. But there are simple steps you can take to put risk in context and feel more confident in your decisions.

THE covid-19 pandemic recently passed the milestone of a million deaths, and infections continue to rise. For months to come, perhaps years, we will have to keep a balance between minimising the deaths and harms caused by the coronavirus and carrying on with life to maintain our economic livelihoods and mental well-being.

"Getting through this pandemic is essentially an exercise in risk management," says Allison Schrager, an economist at the Manhattan Institute in New York. To do this well, we have to rely on the information we get from public health experts, the media and governments. We want to know how dangerous the virus is to us, and to friends or loved ones made perhaps more vulnerable by age or other factors. We want to know the risks stemming from the current surge in infection rates, so we understand whether measures such as renewed lockdowns are proportionate.

Risk communication is a tricky business even at the best of times, but in many countries, the covid-19 pandemic has brought a deluge of scary-sounding statistics and graphs about infection rates and rising death tolls. David Spiegelhalter, chair of the Winton Centre for Risk and Evidence Communication at the University of Cambridge, has called it "number theatre".

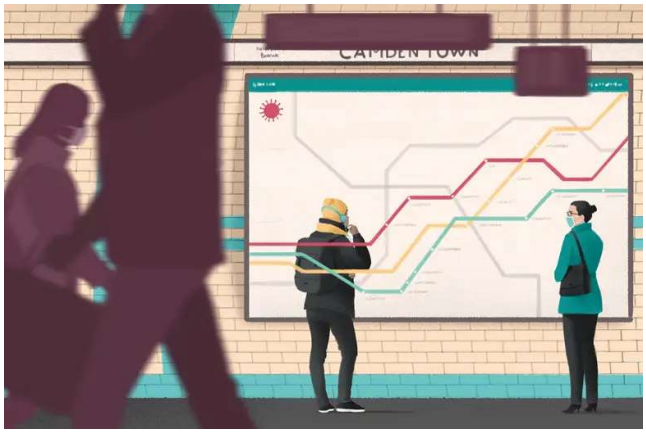
1 in 106 – Lifetime risk of dying in a motor vehicle crash in the US (Nat'l Safety council)

So how do we take the drama out of the theatre and come to a measured assessment of the uncertainties we face? There are no easy answers, but by understanding how our brains deal with risk and the pitfalls in the way numbers concerning risk are often presented to us, we can go some way to easing the mental burden – through the pandemic and beyond.

Despite nearly non-stop media coverage since the start of the year, the covid-19 pandemic remains an unfamiliar threat for most of us. This is where the difficulties with assessing its risks start. "We're comfortable with risks we take every day, but new and dramatic ones throw us," says Schrager.

"The emotional impact skews how dangerous 'dread risks' seem to us"

That's especially true when single events cause harm to lots of people in a short period, like plane crashes, terrorist attacks and natural disasters. Images of such events fire up parts of the brain evolved to evaluate risk and make us take notice. "One region, the amygdala, responds to the degree to which things are risky, while the ventromedial prefrontal cortex allows us to weigh the costs and benefits of different options so that we can decide what, on balance, is the best thing to do," says Joseph Kable, a neuroscientist at the University of Pennsylvania.



The trouble is that these evolved responses can cloud rational thinking when threats are new and dramatic. Risk researcher Gerd Gigerenzer at the University of Potsdam, Germany, calls these threats with an emotional impact that skews how dangerous we think they are "dread risks". "Even though they cause fewer deaths than risks we happily live with, dread risks capture the attention of the media, stoke anxiety in us and make us fear some things excessively," he says.

That fear can change our behaviour in ways that actually increase our risk of injury or death. In 2004, Gigerenzer infamously found that after the 9/11 attacks, when lots of people were terrified of flying, many took the more dangerous option of driving. "As a result, an estimated extra 1600 Americans lost their lives on the roads," he says.

Similarly, people now are avoiding visits to hospitals because they are so scared of getting covid-19. According to the World Stroke Organization, in the first months of the pandemic, across 100 countries studied, hospital admissions for stroke symptoms dropped by an average of 60 per cent compared with the same period in 2019. There were similar declines for heart attack admissions in the US and UK. One study in England and Wales found that, between March and the end of June, missing out on essential care led to 2085 more deaths from heart disease and stroke than would be expected normally, or 17 extra deaths a day.

> 1 in 9821 – Lifetime risk of dying in an air or space transport accident in the US
> (National Safety council)

The dread risk of covid-19 differs from events like 9/11 because it is primarily driven by numbers, rather than visceral images. Images of people suffering or dying from the virus have been conspicuous in their absence, because of the need to isolate patients. But numbers alone can be sufficient to induce dread, particularly when we don't have a firm handle on what they really mean.

That points to a second problem beyond our evolved fear responses that makes risk assessment tricky. "Most people have no training in statistical thinking," says Gigerenzer. Even numbers associated with everyday risks can throw us. What does a weather forecast telling us there is, say, a 30 per cent chance of rain tomorrow signify? "Some think it means it will rain 30 per cent of the time, others that it will rain in 30 per cent of the region the forecasts covers, and still others that three out of 10 meteorologists would predict rain," says Gigerenzer – not what it actually means, that there is a 30 per cent chance of there being any rain at all.

That's a relatively harmless example, but similar ambiguities or missing context can mislead us with health risks too. For instance, when in the mid-1990s the UK Committee on Safety of Medicines warned that some contraceptive pills doubled the risk of potentially deadly blood clots, or thrombosis, that prompted many women to stop taking them. A spate of unwanted pregnancies led to an extra 13,000 abortions the following year.

10x The risk of passing on the coronavirus inside a home is 10 times higher than that of passing it on in hospital, and 100 times higher than infecting others on public transport.

The thrombosis risk sounded alarming, but in absolute terms it meant that 2 in 7000 women who took a third-generation contraceptive pill experienced thrombosis, compared with 1 in 7000 for women on the second-generation pill. The initial risk was low and so the relative doubling of risk meant the absolute risk was also low.

We often need both kinds of information to put a given risk or benefit in perspective. But even supposed experts can get confused about them – something we have seen during the covid-19 pandemic as well. In August, Stephen Hahn, head of the US Food and Drug Administration, made headlines when he said that blood plasma taken from people who had recovered from covid-19 would, when given to those infected, save 35 lives for every 100 people treated. In reality, a poorly designed study had found that the plasma treatment reduced covid-19 fatalities from around 14 per cent to 9 per cent – a relative risk reduction of 35 per cent, but an absolute risk reduction of just 5 per cent, meaning the treatment would save five out of every 100 covid-19 patients.

1 in 4000 – Risk of coronavirus infection passing between passengers on a full commercial flight. This drops to 1 in 8000 if the middle seat is left empty. Source: Imperial College London

For those of us trying to navigate the choppy waters of coronavirus risk, simply being aware of the difference between relative and absolute risk, and knowing which one a given number represents, is already a big step in understanding its true relevance. But even then, trying to pin down the risks around covid-19 can be a befuddling exercise. New information is emerging all the time. The risk that covid-19 poses for each of us – either in absolute or relative terms – depends on how old you are and whether you have any pre-existing health conditions.

“An 80-year-old is 1000 times more likely to die from covid-19 than a 20-year-old”

“The link between age and the chances of covid-19 being fatal for you are astonishing,” says Spiegelhalter. “An 80-year-old is 1000 times more likely to die from it than a 20-year-old.” Estimates from a team at Imperial College London have put the chance of dying from covid-19 if you catch it when you are aged between 10 and 20 at 0.006 per cent, or six deaths for every 100,000 people of that age infected. By the time you are in the 40-49 age bracket, the risk goes up to 15 in 10,000 and if you are over 80 years old, it is almost 1 in 10.

Risk profusion

As so often, the significance of these numbers is difficult to assess without additional context. To attempt to give it, in the US the lifetime risk of dying in a motor vehicle crash is 1 in 106, according to estimates compiled by the National Safety Council, a US non-profit organisation. The lifetime risk of dying of heart disease is 1 in 6.

To more meaningfully compare how covid-19 increases your chances of dying compared with life’s other risks, however, Spiegelhalter suggests we should size it up against the risk of dying in the following year, our annual death risk. This rises exponentially from the age of about 10, doubling every eight years or so. Getting covid-19 doubles your normal annual risk

of dying – still very low if you are young, but higher the older you get.

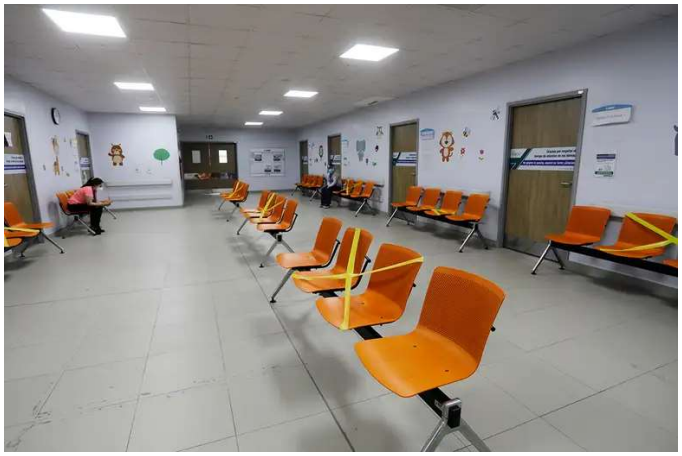
There is a further complication. All these risk estimates describe the infection fatality rate, the likelihood of dying if you have covid-19. There is also the population fatality rate, the likelihood of both catching covid-19 and dying. It is easy to mix these figures up, with consequences that can skew rational personal and public policy responses.

116 in 1000 – Number of people in their mid-70s and older who will die if infected by the covid-19 virus. That compares with less than 1 per 1000 for people under 50
Source: MIT Sloan School of Management

In May, for instance, the UK's Office for National Statistics published a report revealing big differences in the population fatality rate for various ethnic groups. It found it was almost twice as high among black people than white people. Yet news stories left many people believing that if you are black and get covid-19 you are twice as likely to die as if you are white – not that widespread health inequities make minorities more vulnerable to infection.

As for risk for infection on its own, those numbers are even more challenging to pin down because there are so many different factors that can contribute – including overall exposure to the virus.

For all the confusion, when used properly numbers can help us calibrate our natural fear and anxiety. In the context of coronavirus, the picture they present is broadly reassuring, especially if you are healthy and under 50. But that certainly doesn't mean exposure to the virus is risk-free for younger people, far from it: we are still struggling to grasp the true toll of persistent symptoms, or long covid.


Many people have avoided critical emergency care for fear of catching covid-19 in hospital

And even if personal risk is low, the risk that you may spread the infection to other more vulnerable people remains. That is why, in deciding how we react and deal with the uncertainty of the pandemic, we need to go beyond individual risk and think about collective risk, says Nassim Nicholas Taleb at New York University's Tandon School of Engineering. "In a pandemic, individual risks can be low while collective risks are high."

"We need to go beyond individual risk and think of collective risk"

This additional wrinkle comes about because infectious diseases spread and multiply through society in a way that other individual risks, like those of car crashes or heart attacks, don't. Although these other risks are stable over time, and society has the capacity to cope with them, a new outbreak adds an unexpected strain on the whole system, threatening to grind societies to a halt. "Pandemics are so unpredictable," says Taleb. When he and Pasquale Cirillo at Delft University of Technology in the Netherlands looked at mass outbreaks of infectious disease over the past 2500 years, they found that most had a relatively small impact. But a small number were disastrous.

The Black Death killed up to 200 million from 1331 to 1353, for instance. Scaled up as a percentage of world population today, that would be nearly 4 billion deaths. “A new one can die out quickly, or rapidly get out of hand and turn into a real existential threat,” says Taleb. In January, he argued that extraordinary precautions were required to ensure this outbreak didn’t spiral out of control. “You can’t come back from ruin,” he says. The collective threat of covid-19 means we are all in it together. “It’s crucial people recognise that being part of a society means taking responsibility for others,” says Gigerenzer.

Mixed messages

So what does that look like in practice? How can we evaluate the risks we face personally – and across society – and make decisions that enable us to carry on with life? It isn’t simple. Uncertain, hard-to-interpret situations create ambiguity, which elicits bigger responses in brain regions that register risk, making it all the more difficult to keep threats in perspective, says Kable. We all vary in both our tolerance for uncertainty and what we deem to be an acceptable level of risk.

2x – Men have about twice the risk of death from covid-19 compared with women
Source: The Lancet

That said, there are some rules of thumb that risk specialists recommend. To begin with, try to keep perspective, both by determining whether the numbers you are dealing with represent relative or absolute risks, and by evaluating whether your emotions are amping up their significance. Also, stay up to date. While obsessively following coronavirus news can have its own mental health risks, in a situation changing this rapidly, it is important to seek out trusted sources and evaluate risk assessments as new information comes in. For instance, early in the pandemic, it seemed that surfaces could be a major source of spread. Now the latest evidence is that sharing air indoors may be the most dangerous factor. Remember too that you cannot eliminate risk altogether, and that there are trade-offs: avoiding one risk may create other, worse ones.

To help get our heads around all of this, some public health officials believe it may be useful to set yourself a weekly “contact budget” – taking into account your personal circumstances and vulnerability to severe consequences of infection, and then aiming to limit the number of activities with higher levels of potential exposure to the virus (see “Your contact budget”). It is also critical to consider how your choices could imperil or protect other people, says Gigerenzer.

Although we aren’t out of the woods yet, this pandemic will eventually pass. But will we learn anything from it? “I think this is going to change us a lot, and we’ll handle this very differently in the future,” says Schrager. “In many countries, including the US, risk communication has been a big public health failure. There’s been no real consideration of how to make the risks associated with covid-19 meaningful, and how to communicate these in a way people can understand.” Perhaps one benefit of this crisis is that it will finally serve as a wake-up call for the importance of improving how we talk – and think – about risk.