



Canadian probability and maths expert Professor Jeffrey Rosenthal, who is also a pianist, at the Mayfair Hotel. Picture: ROGER WYMAN

SA News

## Canadian probability expert Professor Jeffrey Rosenthal explains how we can all get better at playing the odds

Tim Williams, The Advertiser  
December 12, 2016 12:35am

 Subscriber only

HOW do you expose widespread fraud within a lottery system?

For Jeffrey Rosenthal, the answer was to do the maths.

A decade ago, the Canadian expert in probability, who had shot to prominence with a best-selling book on the subject, was asked by investigative journalists to crunch some numbers on the likelihood of ticket selling agents winning big prizes.

It followed the 2001 case of an elderly Ontario man who always played the same lotto numbers based on his grandchildren's birthdays.

A female employee at the shop where the man bought his tickets, and went to have them checked, hid the fact that he had won \$250,000 and claimed the winnings as her own.

When the man realised what had happened, he fought for four years before the Ontario Lottery and Gaming Corporation paid him \$200,000 of his winnings on the condition he kept quiet about the battle.

The insistence on confidentiality led the journalists to suspect a broader problem.

That's when they called upon Prof Rosenthal, who calculated that over seven years, lottery ticket sellers had won 200 of 5700 prizes of \$50,000 or more, when it should have been 35 to 50.

It prompted an investigation that resulted in several arrests for fraud, payouts to rightful winners of more than \$20 million, and significant changes to lottery rules.

“It became a huge story in Canada, front page news,” he says.

The scandal highlighted the importance of being able to calculate odds and acting accordingly, something most of us are not very good at.



 You have about a one in 45 million chance of winning an Oz Lotto jackpot, says Professor Jeffrey Rosenthal.

---

That's why we keep playing lottery games, despite our chances of dying in a car crash driving to the newsagent to buy a ticket being better than the chance of winning the jackpot.

Prof Rosenthal says that as a result, many people worry about the wrong things, like dying in a plane crash or being the victim of a horrible violent crime.

He says we'd be better off worrying about the very big chance of dying of heart disease, and managing our diets and exercise to minimise that risk.

He thinks our over-inflated fear of being violently killed probably goes back to our primitive ancestors who lived in small bands, so the loss of any one of them had a big impact.

These days the chance of any one of us being murdered among the huge populations of our cities is minimal, yet killings remain big news around the globe.

Prof Rosenthal says that makes it easy for politicians to run on anti-crime platforms, even when crime rates are going down. So our inability or unwillingness to do our own basic number crunching means we fail to keep governments accountable for their policies and spending.

The solution? We need to collectively get better at maths. To do that, we need to like maths enough to stick at it. And that means teachers and parents need to get enthusiastic about it.

“Some people almost take pride in being bad at maths. In Canada, a lot of elementary teachers don't like maths,” he says, suspecting the same is true of Australia.

Prof Rosenthal says being realistic about odds can change our thinking. He used to be nervous about flying, but not after realising just one in every five million commercial flights ends in a fatal crash.

And we should not be so surprised by a coincidental meeting with friends or acquaintances. Given we all know quite a few people, and see thousands more as we go about our lives, the odds of such meetings aren't that long.

Prof Rosenthal will give a free talk in the Horace Lamb lecture theatre, Adelaide University, tomorrow from 6-7pm.



 Canadian Professor Jeffrey Rosenthal was asked by investigative journalists to crunch some numbers on the likelihood of ticket selling agents winning big prizes.

---

## ONE EXPERT'S TAKE ON LIFE - BY THE NUMBERS

### Professor Jeffrey Rosenthal

- Works in the Department of Statistics, University of Toronto.
- Author of *Struck by Lightning: The Curious World of Probabilities*, a bestseller in Canada and produced in 16 editions and 10 languages.
- Used his mathematical expertise to expose a lottery scandal in Ontario, in which ticket sellers were fraudulently claiming other players' winning tickets as their own.
- Also an improvisational comedian and musician, rewriting the lyrics of popular songs to be about maths.

### What he says

- You have about a one in 45 million chance of winning an Oz Lotto jackpot. If you have to drive to the newsagent to buy your ticket, you're six times more likely to get killed in a car crash on the way than winning the jackpot.
- There's about a one in 3 million chance that a randomly chosen Australian will become PM.
- Only one commercial flight in 5 million crashes badly enough to cause fatalities.
- The chance meetings you think are "one in a million" coincidences aren't really that remarkable. Depending on the circumstances, they could be more like one in 200.
- People worry too much about unlikely events, such as their child being abducted. On the other hand, one in three people die from cardiovascular disease, so we should worry more about diets and lack of exercise.