**Risk Activities**

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| **Activity** | **Aim** | **Comments** |
| Defining risk | Class discussion about the definition and numbers associated with risk |  |
| What’s risk got to do with it? | Insurance and risk | [http://www.scholastic.com/ nextgeneration/lessons&worksheets/ risk.htm](http://www.scholastic.com/%20nextgeneration/lessons&worksheets/%20risk.htm) |
| Evaluating Risk: Are bacon sandwiches bad for you? | Using pictorial representations to understand risk. | [http://motivate.maths.org/content/ MathsHealth/Risk](http://motivate.maths.org/content/%20MathsHealth/Risk) |
| Statistics: More than numbers |  |  |
| Media reports about risk | Holiday road toll – low frequency probability.  Benefits of Chocolate- reduced risk. |  |
| Health: Survival probability game | Decisions involving risk to others. | [http://motivate.maths.org/content/ MathsHealth/HealthEconomics](http://motivate.maths.org/content/%20MathsHealth/HealthEconomics) |
| The test is positive: What are the odds its wrong | Tree diagrams with natural frequencies and proportions. | [https://motivate.maths.org/content/ MathsHealth/PositiveTest](https://motivate.maths.org/content/%20MathsHealth/PositiveTest) |
| Critical questions on risk |  |  |

**Really useful Websites**

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|  | **Link** |
| Communicating risk to the public | <http://www.decisionsciencenews.com/2010/12/03/some-ideas-on-communicating-risks-to-the-general-public/> |
| Communicating risk article | <https://plus.maths.org/content/understanding-uncertainty-2845-ways-spinning-risk-0> |
| Risk literacy project | <http://www.riskliteracy.org/> |
| Gerd Gigerenzer – videos and articles on risk | <https://www.harding-center.mpg.de/en> |
| Risk literacy video | <https://www.youtube.com/watch?v=g4op2WNc1e4> |
| Blogs and articles on risks. | <http://www.senseaboutscience.org/cgi-bin/search.cgi?q=risk> |
|  | http://understandinguncertainty.org |
| Lecture series on risk | <http://sms.cam.ac.uk/collection/728627> |
| O’Carroll Maths | <https://sites.google.com/site/ocarrollmaths/home> |

**Defining Risk Discussion:**

* From daily life, from what you have been taught in school or from the media, what do you know about the concept of risk? Explain
* Which of these definitions of risk do you prefer? Explain
  + A probability with a negative connotation.
  + A type of probability that has no theoretical model.
  + An uncertainty that has a numerical value.
  + Other – (explain). Explanation of choice of decision
* How does the study of probability and risk help you make decisions?
* How do you deal with the risks associated with driving a car? (Try to avoid? Buy insurance? Enjoy them? …)
* Describe a risky activity in which you have been involved. For the activity you were involved in, how much risk was involved? How did you arrive at your risk-estimate? If your answer to the above question is categorical (i.e. using a word like ‘high’ or ‘low’ rather than a number) express it numerically, using a percentage. Explain the basis for your figure would your friends who are involved in the same risky activity give the same numerical value as you for its risk? Explain
* Describe a decision that you made that involved risk. For the decision you made, how much risk was involved? How did you arrive at your risk-estimate? If your answer to the above question is categorical (i.e. using a word like ‘high’ or ‘low’ rather than a number) express it numerically, using a percentage. Explain the basis for your figure. Would your friends who are involved in making the same decision give the same numerical value as you for its risk? Explain

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**Media Reports**

**Eric Crampton: Truth behind that holiday road toll**

10:30 AM Friday Jan 16, 2015[145 comments](http://www.nzherald.co.nz/nz/news/article.cfm?c_id=1&objectid=11387387#comment-form)



The road toll this holiday season was more than double that of a year earlier, but that doesn't mean enforcement efforts have failed. Photo / Ruth Keber

People have a bad habit of wanting to tell stories about random low-probability events. Whether it's a few dog attacks that happened in the same couple of weeks, or a blip in youth drinking rates, people want to know why.

Often, the best answer is that we should ignore individual monthly data points and look to the longer term trend.

The most recent holiday road toll statistics provided fodder for a lot of armchair reckonings over the past week. There were 15 fatal crashes this holiday season; last year, there were six.

Nobody has been keen to take credit for the increase, though we can be fairly sure that if the figure had halved instead of doubling, the police would have credited tough speed enforcement measures and the drop in the blood alcohol limit.

And so we all look for stories to explain the difference. Perhaps everyone had their eyes on the speedometer rather than on the road for fear of breaching the tighter speed enforcement rules.

Maybe strict enforcement of the 100km/h limit led to more dangerous overtaking situations.

But the best explanation is probably that events like this can fluctuate a lot from year to year. Accident rates are very low. New Zealand has about eight traffic fatalities for every billion kilometres driven.

So if you drove a billion kilometres this holiday season, you could expect to have died eight times. If you drove a more normal, but still high, thousand kilometres, you would have about a 0.0008 per cent chance of being in a fatal accident.

Or, for every 125,000 vehicles travelling 1000km over the holiday season, we would expect one death.

When events are infrequent, like fatal traffic accidents, small things can affect the figures.

Blogger James K, at [Ordinary Times](http://ordinary-gentlemen.com/), points out that this year's holiday season was two days longer than last year's, so we should have expected a 20 per cent rise in accident rates solely because of that.

He also shows that when we look at longer-term trends in the daily number of crashes, this year's figures remain within the expected range.

It is a bit odd that this year's figures are higher than last year's despite changes to the drink-driving limit and police speed enforcement, but accident rates in any one season are likely to depend more on the holiday weather than on recent policy changes.

This summer's been particularly nice in Wellington. If the weather had been worse, more people would have stayed home and fewer people would have died in car accidents.

But again, that is just a story. We would need to check longer term accident rates against the weather to be able to tell.

And plausible-sounding stories often fail to bear up. Having been frustrated in a couple of queues this season, I wondered whether tougher enforcement of the 100km/h limit had led to more dangerous overtaking manoeuvres.

But the Ministry of Transport told me that only one of the 15 crashes resulted from overtaking. It would be a stretch to say that one out of 15 is higher or lower than expected - you have to look to longer-term trends to be able to draw conclusions.

Whether it's dog attacks or other random, low-frequency events, it's always best to look to the longer-term trends rather than tell stories based on statistical blips.

*Dr Eric Crampton is the head of research at The New Zealand Initiative.*

- [NZ Herald](http://www.nzherald.co.nz/)

**More good news for chocolate lovers**

12:20 PM Tuesday Jun 16, 2015

Dark chocolate is usually said to have more beneficial effects than milk chocolate.
Photo / Thinkstock

Dark chocolate is usually said to have more beneficial effects than milk chocolate. Photo / Thinkstock

Eating up to 100 grams of chocolate a day has been linked to a lowered risk of heart disease and stroke.

Research led by the University of Aberdeen has concluded there's no evidence for cutting out chocolate to lower the risk of cardiovascular disease.

The study found that, compared to people who ate no chocolate, those with a higher intake had an 11 per cent lesser risk of cardiovascular disease and a 25 per cent reduced risk of associated death.

It was also linked with a 9 per cent lower risk of hospital admission or death as a result of coronary heart disease, while it was similarly associated with a 23 per cent reduced risk of stroke, even after taking into account other factors.

The study is tracking the impact of diet on the long-term health of 25,000 men and women in Norfolk.

The authors pointed out that dark chocolate is usually said to have more beneficial effects than milk chocolate, but milk chocolate was more frequently eaten by the Norfolk participants.

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**Risk Critical Questions**

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| **Big Idea Question** | **Details** | **Critical Questions** |
| Risk of What? | People need to understand the outcome to which the risk refers.  Since there is no such thing as zero risk the size matters. The size should be expressed in absolute terms or the base line information must be given.  People must also understand that there are two types of errors; false positives and false negatives | * *What is the baseline? Has information about the baseline been included?* * *Are the harms and benefits being expressed in the same format?* * *Is the risk in relative risk form or absolute risk form?* * *Can the risk be shown in different formats, visual and numerical?* |
| What is the Frame?  -Time frame and wording | Time frames, such as in the next ten years, are easier to understand than life time risks. | * *Is the time frame stated?* * *Are the time frames for the two risks I am comparing the same (for example in relative risk and an odds ratio)?* * *What is the framing of the question?* * *Is it a positive or negative frame? Is it a loss or gain frame?* |
| Does it apply to me? | Checking to see if the risk information is based on studies of people just like the person receiving the information. | * *To whom does the risk apply?* * *Do I share the same characteristics as these people?* |