

Living with risk

It is perfectly normal to calculate risks associated with particular activities. When you ride a bike or cross a road, you learn to reduce the chance of an accident. Sometimes people like taking risks, for example riding a roller coaster or bungee jumping. But a miscalculation may result in injury, perhaps even death. Things happen.

Would you rather?

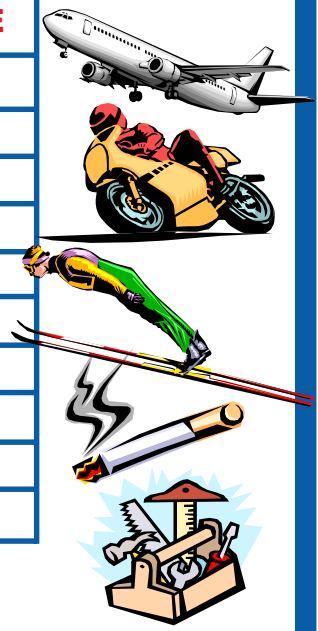
Q1 Which of the following activities would you be prepared to do *every day for a year*? (Assume that you had plenty of time and did not have to pay for the activity.)

I would be prepared to do this daily for a year:

- | | | | | |
|-----------|------------------------|-------------------------|--------------------------|---------------|
| A | B | C | D | E |
| willingly | only if I'm
paid £5 | only if I'm
paid £50 | only if I'm
paid £500 | not at
all |

Put a tick for how willing you are to do each activity.

Activity	How willing are you to do each activity?				
	A	B	C	D	E
Travel 500 miles in passenger aeroplane					
Travel 150 miles in a helicopter					
Travel 50 miles by rail					
Travel 50 miles by car					
Be a motorcycle passenger for 50 miles					
Rock climb for an hour					
Ski for an hour					
Play football for an hour					
Smoke cigarettes for an hour					
Do odd jobs at home					



Q2 Which of the activities listed would you be **most** willing to do?

Q3 Give your reasons why you would be willing.

Q4 Which of the activities listed would you be **least** willing to do?

Q5 Give your reasons why you would be unwilling.

Q6 *Before discussing it with anyone else*, try to decide which three activities would pose the greatest risk of death and which three would be the safest (pose the least risk of death).

Greatest risk of death

Safest

1st.....
2nd.....
3rd.....

1st.....
2nd.....
3rd.....

Making informed decisions

Both individual decisions and public policy often rely on a calculation of risk; for example, health related issues, such as smoking. Yet scientists are sometimes unable to agree the extent of risk associated with e.g. eating beef or the use of mobile phones.



What exactly does *risk* mean? You say something is 'likely' if there is more than an even chance of it happening, more than 50%. Something that has a 90% chance of happening is 'very likely'. And something that has a 5% chance of happening is 'very unlikely'. You are talking *probabilities*.

Because it has six sides and six numbers, rolling a die gives a 1 in 6 chance of coming up with any particular number, about 17%.

A good way of predicting probabilities is to record what proportion of people experience

something. The chance of death by lightning, for example, is one in 10 million – not very likely, a low risk.

Another way of expressing risk is to consider the hours involved, expressing risk as a fraction of the total time spent in the activity.

When you think about risk, you also take into account the *consequences*: how seriously you might be hurt. A scratch or cut? A bruise? Activities that can lead to death should things go wrong carry a greater risk.

risk = probability (of an event occurring) x consequence (if it does)

The information in the table below records data relating to actual deaths. Because risks are usually small, the chances of it happening are expressed as a small part of a very big number. One billion is 1,000,000,000.

- One billion hours is more than 110,000 years.
- The chances of winning the jackpot on the National Lottery are less than 100 in a billion.

Table 1 Risk from death of various activities in the UK

Number of deaths per billion hours of the people involved			
Rock climbing	40,000	Oil and gas extraction	150
Motorcycle racing	35,000	Average man in his 30s from accident	80
Travel by helicopter	5,000	Average man in his 30s from disease	80
Skiing	900	Travel by train	50
Policeman in Northern Ireland	700	Factory work	40
Construction workers on high building	700	Accident at home – all ages	40
Smoking – average	400	Accident at home – able bodied	10
Travel by air	400	Terrorist bomb in London area	0.1
Travel by car	300	Building falling down	0.02
School/college football	300		

Table 1 shows the **relative** risks of death from the activities listed. However, it does not remove the uncertainty about what will happen to any individual. Things do happen to some people even when highly unlikely.

Energy use – the big picture

Q7 How do your guesses about the riskiest and safest activities compare with the tables of statistics? Do they agree?



Q8 Which is better for your health – playing football or being a car passenger? How can you decide? Do the tables of death statistics help you?

The psychology of risk

Some activities are freely chosen, e.g. rock climbing. Other activities people have no control over; for example, they come with the job, like being a policeman. Whether you choose an activity freely or not affects what you regard as an *acceptable* risk. After 11 September 2001, when four American aircraft were hijacked by terrorists and crashed, many people decided that air travel was too risky. Passenger numbers fell so dramatically that several major airline companies went out of business within weeks.

Making comparisons of risk

It is not easy to use and compare risk information. The records in Table 1 summarise a complex picture, perhaps for the whole UK population, some 60 million people with all their differences and all their particular stories. For example,

- They give no information about non-fatal injuries – injuries which did not result in death.
- Some of the statistics only apply to some people. Toddlers do not ‘play football for an hour’, nor do many females of any age.

Table 2 shows the number of people who died through accidents in different jobs. These numbers have been scaled to be out of a million so that different jobs can be compared.

Table 2 Average annual death rates at work in the UK for every 1,000,000 workers at risk

	1974-78	1987-90
Coal miners	210	145
Offshore oil and gas	1,650	1,250
Railway workers	180	96
Building industry	150	100
Shipbuilding	105	21
Agriculture	110	74
Manufacture of cars	15	12
Manufacture of clothing	5	0.9



Q9 What general difference is there between the figures for 1974 – 78 and those for 1987– 90? Suggest why there is this difference.

Q10 Which appears to be the safest ‘energy resource’ from using this table? Notice that it is difficult to judge across all energy resources because there is no information for some – uranium is not mined in this country; building wind farms is only a small part of the building industry.