

# TIM HARFORD

## THE UNDERCOVER ECONOMIST



### How much is a (micro)life worth?

*‘Travelling 28 miles on a motorbike is four micromorts; cycling the same distance is just over one micromort’*

The Rand Corporation was established in 1948 as an independent research arm of the US Air Force, itself newly independent and in its pomp as the wielder of the US nuclear arsenal. Rand’s early years were spent wrestling with the mathematics of Armageddon, and it has long struggled to shake off its reputation as the inspiration for Dr Strangelove.

Yet Rand’s most controversial research topic was its very first study — and its crime was to offend not the public but the top brass at the Air Force. Edwin Paxson, one of its top mathematicians, had been asked by the Air Force to think about the problem of an optimal first strike against the Soviet Union. How could the United States annihilate the Soviet Union for the smallest possible expenditure?

Paxson’s research was technically impressive, using cutting-edge analytical techniques. (The project is described in histories by David Jardini and by Fred Kaplan, and in a new article in the *Journal of Economic Perspectives* by Spencer Banzhaf.) His conclusion, published in 1950, was that rather than commissioning expensive turbojet bombers, the US should build large numbers of cheap propeller aircraft, most of which would carry no nuclear payload and would be little more than decoys. Not knowing which planes held atomic weapons, the Soviet defences would be overwhelmed by sheer numbers.

This conclusion infuriated the Air Force. No doubt this was partly because they viewed old-fashioned propeller aircraft as beneath their dignity. But the key offence was this: Paxson’s cost-benefit analysis gave no weight to the lives of air crew. Ten thousand pilots could be wiped out and it would make no difference to Paxson’s arithmetic. Under fire from senior officers, who had been wartime pilots themselves, Rand quickly adopted a more humble tone. It also diversified its funding by researching non-military topics.

Yet Paxson’s omission is understandable. A sensible strategist must weigh

the costs and benefits of different tactics — but once one accepts the need for value for money in military strategy, what monetary value can we put on human life?

One possible approach to the problem is to value people according to some economic proxy — for example, the Air Force might value the cost of training new pilots. Courts have assigned damages after fatal accidents by looking at the economic output the dead person would otherwise have produced. But this suggests that the life of a retired person has no value. It captures the loss of livelihood, not the loss of life.

In the 1960s, a new approach emerged, most famously in Thomas Schelling's 1968 essay "The Life You Save May Be Your Own". Schelling, who much later won the Nobel Memorial Prize in Economic Sciences, had spent some productive time working at Rand. His student Jack Carlson was a former Air Force pilot. Carlson and Schelling found a way to finesse the treacherous question. As Schelling wrote: "It is not the worth of human life that I shall discuss but of 'life-saving', of preventing death. And it is not a particular death, but a statistical death."

Rather than asking "What is the value of human life?" Schelling and Carlson asked what we are willing to pay to reduce the risk of premature death by spending money on road safety or hospitals. The value of a life was replaced with the value of a statistical life.

There is good sense in this bait-and-switch. The life of a named individual defies monetary valuation. It is special. Yet the prospect of spending money to widen and straighten a road and therefore fractionally reduce the chance that any one of thousands of road users will die — that feels like a more legitimate field for economic exploration.

For those who have not read Schelling's elegant essay, simply inserting a qualifier into the phrase "the value of a [statistical] life" will not persuade. This presents a serious public-relations problem. From time to time it emerges that government bureaucrats have been valuing human life — outrageous! (The going rate for an individual life in the US is about \$7m.)

As Trudy Ann Cameron, a professor of economics at the University of Oregon, comments, it would be helpful for economists to be able to report their research on the benefits of environmental or health policies "in a way that neither confuses nor offends non-economists".

Here's a possible solution: use microlives. A microlife is one millionth of an adult lifespan — about half an hour — and a micromort is a one-in-a-million chance of dying.

Sir David Spiegelhalter, my favourite risk communication expert, reckons that going under general anaesthetic is 10 micromorts. Travelling 28 miles on a motorbike is four micromorts; cycling the same distance is just over one micromort. The National Health Service in the UK uses analysis that prices a microlife at around £1.70; the UK Department for Transport will spend £1.60 to prevent a micromort. In a world where life-and-death trade-offs must be made, and should be faced squarely, this is a less horrible way to think about it all. A human life is a special thing; a microlife, not so much.

As Ronald Howard, the decision analysis expert who invented the micromort, put it back in 1984: “Although this change is cosmetic only, we should remember the size of the cosmetic industry.”

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