"The Quantification of Personal Risk"

Dr Frank Duckworth – Editor of the Royal Statistical Society's Journal

Dr Duckworth's name is well known to one-day cricket fans. He and fellow statistician Tony Lewis developed the Duckworth-Lewis scale for calculating the target scores for teams batting second in rain interrupted 20:20 matches.

His lecture outlined the principles behind his attempt to devise a simple method to quantify risk and thereby enable individuals to make more informed decisions about risk acceptability. He identified eight classes of risk ranging from acts of god to domestic mishaps and considered each in terms of exposure (acute, chronic or habitual) timescale and consequences. The consequences included loss of life, reduced life expectancy and quality of life and where appropriate these were integrated over the lifetime of the individual. The expected utility is equal to the benefits – any expected losses (consequential losses x probability of the loss occurring). In general it is assumed that the more the benefits outweigh the expected losses the more likely that the risk will be deemed acceptable.

His final equation was a logarithmic function that yielded a value of 8 for successful suicide. Using published statistics for males, his equation gave values of 0.3 for a 100 mile car journey, 1.7 for a 1000 mile plane journey, 5.5 for an accidental fall, 6.4 for a 40 year career of deep sea fishing and 7.1 for a 30-year smoking 30 cigarettes a day for the rest of his life. Dr Duckworth emphasised that the figures were only guidelines but they did provide a method of calibrating new risks against known ones. If values up to about 5.5 were deemed to be acceptable then the risk of eating British beef in 1996 at the time of the BSE scare would have been about 2 and even passive smoking gives a value of only about 4.

However using published survey data about the expected chances of a suicide bomber setting off a nuclear explosion in a major western city in the next 10 years gave a value of 7.3. The risk posed by the expected eruption of the underground volcano in Yellowstone National Park within the next 1000 years was 6.9.

Further information is available at f.duckworth@rss.org.uk

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