Enrico Fermi’s piano tuner problem is the classic example of making estimates. The Italian physicist used to ask students to estimate the number of piano tuners in Chicago given only the population of the city. By making a few common sense assumptions (average family size, percentage of families with a piano etc.) he would come up with an estimate within a factor 2 to 3 of the correct result [1].

Applying Fermi’s approach to the recent discussion of air-travel-triggered death by pulmonary embolism could give some indication as to the magnitude of the problem.

In 1996 the total number of air-passengers was 1.3 billion [2]. Last year the total number of deaths due to accidents of multi-engined airliners was 1131. The average death toll over the last 30 years is 1464 casualties per year [3].

Based on clinical data, the overall yearly incidence of pulmonary embolism in the United States is estimated to be 139 per 100 000 [4]. Based on autopsy data, the yearly incidence of fatal pulmonary embolism lies at 94 per 100 000 [4]. A study in France found a yearly incidence of diagnosed pulmonary embolism of 60 per 100 000 [5]. An extrapolation from the USA data gives an estimate of 40 per 100 000 cases of fatal pulmonary embolism in France. In an epidemiological case-control study of deep vein thrombosis 12.6% had undergone a long-distance journey during the 3 weeks before diagnosis [6]. Assuming that 10% of cases of fatal pulmonary embolism occur following long-distance journeys, of which a quarter are by air [7], and that only 1 in 10 air-passengers is a long distance traveller, the estimated total number of cases of fatal pulmonary embolism is as follows: Using the USA data, air-travel would lead to 3000 cases of fatal pulmonary embolism, whereas with the French data, the yearly number would be 1300.

It could well be that more air-travellers worldwide die from pulmonary embolism than through air-traffic disasters. In the event of these estimates being confirmed by prospective studies, air-travel-induced pulmonary embolism would represent an example of biased risk perception, caused by an "out of sight, out of mind" mechanism as described by Fischhoff et al in their classical experiment on fault trees [8].

References
1 http://www.lerc.nasa.gov/WWW/K-12/Numbers/Math/Mathematical_Thinking/fermis_piano_tuner.htm
2 Fasten your safety belts. The Economist, January 11, 1997 (http://www.britannica.com/bcom/magazine/article/0,5744,6430,00.html)
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