

**Dread Risk, September 11, and Fatal Traffic Accidents:
An Example of the Ecological Fallacy?**

Oliver Kuss

Institute of Medical Epidemiology, Biostatistics, and Informatics

Medical Faculty, University of Halle-Wittenberg

Magdeburger Str. 27

06097 Halle (Saale), Germany

Tel.: +49-345-5573582

Fax: +49-345-5573580

e-mail: Oliver.Kuss@medizin.uni-halle.de

Word Count: 480

In a recent article in this journal (Gigerenzer, 2004) Gigerenzer stated that more people lost their lives due reduced air travel and subsequent increased road traffic after the terrorist attack of September 11 than were killed in the four fatal flights. He observed with figures from the national air traffic and road transportation authorities that (1) Americans reduced their air travel and (2) numbers of vehicle miles driven increased after the attack. His conclusion was, that the also observed increase in traffic fatalities was due to many Americans avoiding the risk of flying and driving the unflown miles instead.

We fear, however, that the design of Gigerenzer's study was not suitable to check his hypothesis. Specifically, he is in a certain risk to commit an ecological fallacy, which is the error of judging from aggregated data to individual effects (Rothman & Greenland, 1998). Translated to Gigerenzer's study that means that we can not be sure that the increased numbers of traffic fatalities are actually caused by people driving instead of flying unless we analyse the individual fatalities. Increased traffic incidents may also have been caused by other phenomena, for example by generally enhanced stress and subsequent reduced concentration while driving after the attack. There is also no indication that the increased numbers of vehicle miles driven is actually caused by people who avoid flying, it may be instead that people seek for intensified personal contacts after 9/11 and choose to visit distant relative or friends more frequently.

From an epidemiological point of view, the hypothesis might have been checked best with a case-control design on the level of each individual accident. That means we would pick a certain number of fatal accidents (maybe restricted to those which

occurred after long road trips) which we call “cases” and check if this particular trip would normally (before 9/11) have been undertaken by plane. Corresponding to the cases we pick a number of long road trips where no accident occurred (these are our “controls”) and also check if they would have been undertaken by plane before 9/11. The common estimator for the association between a fatal accident and driving-instead-of-flying is then the ratio of the odds of a fatal accident *with* driving-instead-of-flying to the odds of a fatal accident *without* driving-instead-of-flying. We certainly should use also all the common measures (matching, adjusting for confounders etc.) in case-control studies to reduce bias. Note that the case-control design has also been used previously for judging external factors on traffic accidents (Redelmeier & Tibshirani, 1997).

The actual purpose of Gigerenzer’s article was to promote informing the public about dread risks and that this information could probably save lives. In principle we share his opinion, however, we caution against the uncritical transmission of Gigerenzer’s results and encourage a more carefully designed study to check the hypothesis of the association between fatal car accidents and driving-instead-of-flying after 9/11.

References

- Gigerenzer, G. (2004): *Dread Risk, September 11, and Fatal Traffic Accidents*. *Psychological Science*, 15(4), 286-287.
- Rothman, K.J., & Greenland, S. (1998). *Modern epidemiology*. Philadelphia, PA: Lippincott-Raven.
- Redelmeier, D.A., & Tibshirani, R.J. (1997). Association between cellular-telephone calls and motor vehicle collisions. *New England Journal of Medicine*, 336, 453-8.