



## **Communicating uncertainty: managing the inherent probabilistic character of hazard estimates**

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Science is much more fixing the limits of our knowledge about possible occurrences than the identification of any “truth”. This is particularly true when scientific statements concern prediction of natural phenomena largely exceeding the laboratory scale as in the case of seismogenesis. In these cases, many scenarios about future occurrences result possible (plausible) and the contribution of scientific knowledge (based on the available knowledge about underlying processes or the phenomenological studies) mainly consists in attributing to each scenario a different level of likelihood (probability). In other terms, scientific predictions in the field of geosciences (hazard assessment) are inherently probabilistic. However, despite of this, many scientist (seismologists, etc.) in communicating their position in public debates tend to stress the “truth” of their statements against the fancy character of pseudo-scientific assertions: stronger is the opposition of science and pseudo-science, more hidden becomes the probabilistic character of scientific statements. The problem arises when this kind of “probabilistic” knowledge becomes the basis of any political action (e.g., to impose expensive form of risk reducing activities): in these cases the lack of any definitive “truth” requires a direct assumption of responsibility by the relevant decider (being the single citizen or the legitimate expression of a larger community) to choose among several possibilities (however characterized by different levels of likelihood). In many cases, this can be uncomfortable and strong is the attitude to delegate to the scientific counterpart the responsibility of these decisions. This “transfer” from the genuine political field to an improper scientific context is also facilitated by the lack of a diffuse culture of “probability” outside the scientific community (and in many cases inside also). This is partially the effect of the generalized adoption (by media and scientific communicators) of a view of probability (the “frequentist” view) that is useful in scientific practice but is very far from the common use of uncertain reasoning (that is nearer to the “epistemic” view). Considering probability a sort of physical measure inherent in the process under examination (like an acceleration value) instead of a degree of belief (rationally inferred) about any statement concerning future occurrences tends to hide the importance of a shared responsibility about relevant choices that involves scientists and citizens in the same extent.