

Constraints on the Precautionary Principle and the Problem of Uncertainty

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Kramer and colleagues propose three constraints on the precautionary principle (PP) – consistency, avoidance of counterproductivity, and proportionality – which should be observed in any application of PP (Kramer, Zaaier, and Verweij 2017). I will not examine these in detail. Instead, I will take them for granted as reasonable constraints, while drawing out what I see as a potentially devastating implication of Kramer and colleagues’ proposal to let “opportunity costs”, i.e. costs in the form of foregone opportunities to spend resources differently, count as harms threatening the consistency of PP. My argument is that under a standard definition of uncertainty, the consequence of this proposal is that one must either (1) reject PP as a sound principle of policy- and decision-making, or (2) reject the constraint of consistency. Since the second solution would be contrary to reason, while the first might be ethically undesirable, I propose instead to redefine uncertainty so as to better capture what is at stake in situations calling for some sort of precautionary approach.

A collapsing principle

The basic structure of PP is commonly laid out to consist of a harm-condition, a knowledge-condition, and a recommended precaution (Trouwborst 2006, Steel 2015). The knowledge condition will, since PP is a concept of *ex ante* responsibility in the face of uncertain outcomes, have to be specified according to some definition of uncertainty. While discussing the issue of the knowledge condition to some length, Kramer and colleagues do not explicitly define uncertainty. However, they do discuss different interpretations of uncertainty in the context of blood transfusion risks. They observe that PP has been used under conditions both of “(theoretically) possible” and “proven but unquantifiable” risks (Kramer, Zaaier, and Verweij 2017, 35). The interpretations of uncertainty reflected in these uses arguably conform

to the standard, decision-theoretical definition of uncertainty.¹ According to the decision-theoretical definition, a decision under uncertainty occurs where knowledge of outcomes is limited by a lack of knowledge about probabilities – i.e. where possible outcomes are known, but not their probabilities (Luce and Raiffa 1957, Steel 2015). Below we shall see that under this definition of uncertainty, Kramer and colleagues’ proposal to let opportunity costs threaten consistency can be devastating to PP as a principle of decision- and policy-making. First, I will briefly explain why it is crucial to specify the knowledge condition in applications of PP.

Suppose we employ a version of PP with a permissive knowledge condition, for instance that the mere possibility of serious harm from blood transfusions justifies that actions are taken against it. An implication of this is that merely possible opportunity costs, arising as a result of some recommended precaution, can give rise to inconsistency if they constitute a sufficiently serious threat of harm. This is because the constraint of consistency demands that recommended precautions are tested against the version of PP that is being used (Kramer forthcoming, Steel 2015). In this case, applying PP consistently both to the potential threat and the recommended precaution – assuming that the latter comes with sufficiently serious opportunity costs – can lead to “decisional paralysis”, since neither taking nor not taking precautions would be warranted under PP (cf. Sunstein 2005, Munthe 2011).

Suppose, however, that the knowledge condition is weak because probabilities cannot be assigned in a meaningful way to the threat – i.e. that a decision has to be made under a condition of uncertainty (according to the standard definition from decision theory). It follows from the consistency constraint that even uncertain opportunity costs could then hinder consistent uses of PP. In the case of blood transfusions, this would mean that no precautions could consistently be taken under conditions of uncertainty, even if the threat of harm would be very serious – if serious albeit uncertain opportunity costs could be conceived of.

To see why this is problematic, it can be helpful to look at what this would mean in a case where threats are definitely very serious, for instance in the case of climate change. In the 1990s and early 2000s, probabilities arguably could not be assigned to worst case scenarios from climate change in a scientifically sound way (IPCC 1995, 2001, Schneider 2001).

¹ A third use is also mentioned, namely quantifiable risks (Kramer forthcoming, 8). These are the only risks proper in the standard decision-theoretic typology.

However, many would consider the use of PP reasonable in this case, because of the immense seriousness of the possible harms.² I presume that proponents of PP would fiercely oppose the suggestion that serious but uncertain opportunity costs would imply that PP, due to the consistency constraint, could not be used in this case.

However, under the standard definition of uncertainty, it seems that PP could not be used consistently in this case if opportunity costs are considered serious harms. This makes PP a highly problematic principle – not only in theory, but also in practice, since consistent use obviously is important also in practice. If any uncertain possibility of harmful economic costs could block the use of PP in cases where threats are uncertain (i.e. where probabilities are not ascribed), then PP would seem worthless as a principle of environmental policy, and probably also of health policy. Arguably, PP was developed to deal with uncertainty (cf. the historical versions of PP cited in Kramer and colleagues' paper). If the argument above is sound, however, uncertainty can still make consistent use of PP very difficult in some important cases.

Uncertainty redefined

Could PP be defended from this objection by assuming that economic costs should not be considered harms in the case of very serious hazards? As Kramer and colleagues show in their paper, this assumption would be hard to sustain (Kramer, Zaaijer, and Verweij 2017, also Steel 2015, Munthe 2011). However, there is another way to attack this problem. Namely, by redefining or tailoring the concept of uncertainty to the PP-context. An alternative definition to the decision-theoretic one has been proposed by Daniel Steel (Steel 2015). In *Philosophy and the Precautionary Principle*, Steel proposes to define uncertainty as “the lack of knowledge that would enable outcomes to be predicted” (Steel 2015:101). This definition is very broad, covering the whole spectre from quantifiable risks to (decision-theoretic) uncertainty and ignorance.

However, the definition says nothing about what kind of knowledge that is required for making sound predictions. Steel therefore proposes a technical specification of the definition, where “knowledge” is taken to mean a “model whose predictive validity for the task in question is empirically well confirmed” (2015:101). The two central components of this

² Even strong critics of PP such as Cass Sunstein consider some kind of precautionary thinking to be reasonable in the case of climate change (Sunstein 2005).

definition, “predictive validity” and “empirically well confirmed”, is explained as referring to the accuracy and precision of predictions with respect to empirical considerations of “predictive success”, “model plausibility” and “underdetermination” (Steel 2015:104).

Referring the reader to Steel’s book for details on these considerations (Steel 2015:103–105), I emphasise here one point that is central to the current discussion. According to Steel, the most important question is not about the interpretation of probabilities, but about “the predictive validity of models used to infer the consequences of actions” (Steel 2015:106). Hence, Steel proposes some criteria for deciding when uncertain threats should be considered not only possible, but also plausible – or, in the language of international law, where there are serious grounds for concern (Trouwborst 2006). These are supposed to ensure that PP cannot be blocked by the mere possibility of serious threats of harm from precautions taken against uncertain but serious threats of harm. I do not suggest that Steel’s proposal for a definition of uncertainty is flawless. It may be overly complicated and lacks the elegance of the decision-theoretic definition. However, an alternative definition to the decision-theoretic one is clearly needed in the context of PP, and I would suggest that Steel’s proposal is a good place to start.

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