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A sociological checklist for assessing environmental health risks

Daniel Benamouzig, Olivier Borraz, Jean-Noel Jouzel, Danielle Salomon.

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The contribution of social sciences to risk assessment has often been confined to dimensions of risk perception and communication. This article relates an effort to promote knowledge from the social sciences that addresses other dimensions of risk issues. A sociological checklist produced for ANSES in France helps to identify and analyse social dimensions that should be given attention during the process of risk assessment.

I. Introduction

The contribution of social sciences to risk analysis can be traced to the 1970s. As different disciplines from the natural sciences strived to establish a rigorous method to define the existence, probability and amplitude of risks related to nuclear energy or chemicals in the environment or the workplace, (psycho) sociologists undertook in parallel to study differences in risk perceptions between experts and the lay public. They concluded that risks were mental constructs, not objective facts, whose definition rested on the use of different frames

of reference. The identification of the factors shaping the public's perception of risks led to the development of the subfield of risk communication, designed to reduce the gap between lay and expert perceptions and help policymakers address the legitimate concerns of the general public when managing risks[1].

The wealth of studies dedicated to risk perception, amplification and communication since the 1970s is a testimony to the importance of this field of research. Whilst initially considered outside the process of risk assessment and management as codified by the NRC in its 1983 Red Book, risk perception and communication were taken into account during the 1990s. Progressively, societal concerns were considered important enough to warrant the development of various models. In the most recent, IRGC's risk governance framework (2008), social sciences are integrated in each of the four stages (pre-assessment, risk appraisal, tolerability and acceptability judgment, and risk management)[2]. The journal *Risk Analysis* also testifies to the importance of social science knowledge in governing risks.

Yet, for all their efforts to bring in societal concerns in the process of risk analysis, these models fail to question the separation between science and society. This can be traced back to the initial assumption that the public's perceptions differ from those of experts, although risk perception scholars insisted that both were equally valid. With the multiplication of health and environmental crises, scandals and controversies during the 1990s in Europe, policymakers acknowledged that societal concerns should be taken into consideration along with scientific input in managing risks – but separately.

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1 Paul Slovic, *The perception of risk* (London: Earthscan, 2000).

2 IRGC, *An introduction to the IRGC risk governance framework* (Geneva: 2008).

Accordingly, independent agencies were set up on the basis of a clear separation between risk assessment (domain of the natural sciences) and risk management (where social sciences could be called upon). These agencies never considered the possibility that social sciences might contribute to the characterization of dangers or the definition of risks. In the minds of their promoters, social sciences were only required once the risk had been established, in order to help communicate the findings to the general public and come up with acceptable decisions.

This separation has come under strong criticism from sociologists, anthropologists and political scientists, who have shown that the boundary between science and society is a social construct, designed to delineate a special area of expertise and competence for scientists, leaving the rest to "politics"[3]. But in a context of reiterated scandals and mounting social contention, public authorities have also come to realize that sole reliance on scientific expertise to manage risks, in particular when issues are uncertain, complex and ambiguous[4], is politically hazardous. Accordingly, initiatives have been taken to introduce social sciences in the process of risk analysis. These have taken different forms, from the recruitment of social scientists and the creation of dedicated services, to the participation of social scientists in expert committees, agency boards and the production of expert advice. So far, these initiatives have produced mixed results – in part because the evidence they provide is not well adapted to the

[3] Bruno Latour, *Science in Action: How to Follow Scientists and Engineers through Society* (Cambridge, MA: Harvard University Press, 1987). Sheila Jasanoff, "Contested Boundaries in Policy-Relevant Science", 17-2 *Social Studies of Science* (1987), pp. 195 *et sqq*.

[4] Ortwin Renn, *Risk governance: coping with uncertainty in a complex world* (London: Earthscan, 2008).

dominant forms of knowledge (and their epistemologies and methods of validation) used in traditional risk analysis.

This mismatch has spurred efforts to adapt social science knowledge to the assessment of risk issues. Among these have emerged sociological checklists or guides that aim to introduce a more analytic approach, anchored in academic knowledge but oriented towards pragmatic uses. In the Netherlands, the National Institute for Public Health and the Environment (RIVM) supported in 2003 the elaboration of a questionnaire destined to explicit various forms of « uncertainty ». This checklist mentioned topics such as problem framing, stakeholder involvement or uncertainties based on knowledge[5]. In France, the *Haute Autorité de Santé* (HAS) supported in 2009 the conception of a sociological checklist for its own staff when assessing health technologies[6]. In 2011, the French *Institut de Veille Sanitaire* (InVS) published a guide to help its agents assess the social context when investigating a local environmental health risk alert[7].

In contrast with other possible uses of social sciences, these checklists help to identify dimensions of risk-related issues that contribute to their social dynamic and thus require the contribution of social sciences. They can facilitate the reference to social dimensions that are meaningful for institutional actors, social scientists and other experts alike. The identification of relevant social dimensions can help to delineate what is at stake when examining a specific topic.

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[5] Jeroen van der Sluijs et al., *RIVM/MNP guidance for uncertainty assessment and communication: tool catalogue for uncertainty assessment* (Utrecht/Bilthoven : Copernicus Institute & RIVM, 2004).

[6] Daniel Benamouzig, "L'évaluation des aspects sociaux en santé", 1-2 *Revue Française des Affaires Sociales* (2010), pp. 187 *et sqq*.

[7] InVS et Risques et Intelligence, *Approche du contexte social lors d'un signalement local en santé et environnement* (Paris : InVS, 2011).

Lastly, the dimensions structuring the checklist refer to methods, concepts and questions that are state of the art in the social sciences. By specifying the social dimensions scrutinised in the process of expertise, and by defining the type of knowledge available to analyse them, social sciences can be introduced more usefully in risk assessment.

However, designing such a checklist requires a number of adjustments between social sciences and the institutional context in which they will be used. This article presents the experience of the French *Agence Nationale de Sécurité Sanitaire* (ANSES). In 2011, ANSES supported the conception of a sociological checklist on risk assessment and health safety. This paper will provide the checklist, describing its conception and presenting its contents. Our aim is to spur a discussion amongst risk professionals (academic and non-academic alike) regarding the usefulness of such a checklist and how it could be adapted to other institutional contexts. Our wish is that a checklist such as the one used by ANSES will pave the way to a renewed participation of social sciences to the evaluation of risk issues.

II. Methodology

ANSES was founded in 2010, following the merger of the French food safety agency (AFSSA) with the environmental and occupational health and safety agency (AFSSET). It currently employs approximately 1350 agents, operates 11 research laboratories, and runs 16 experts committees and 14 working groups involving 800 outside experts. It covers a wide range of issues in human, plant and animal health. Acting under the supervision of five ministries (Health, Environment, Agriculture, Labour, and Consumer Affairs), its work is organized around questions (*saisines* or referrals

in French administrative jargon) that are addressed by ministries, NGOs or its own direction.

Whilst the former AFSSA had not shown a particular interest in the contribution of social sciences, save on consumer behaviour, AFSSET had from the outset mobilized social scientists to help assess referrals on highly controversial issues, namely mobile telephony. When ANSES was created, this openness toward social sciences was maintained, since the agency would have to take on highly sensitive issues that could potentially endanger its reputation. A special Social science unit was then created within the department of communication. Stakeholders were closely associated to the agency operations with the help of a sociologist. A social scientist was appointed to the scientific council of ANSES. An early warning system was installed with the help of a team of sociologists. Finally, a growing number of social scientists joined expert committees. Yet as suggested above, this did not always produce a significant impact. Accordingly, the Social science unit asked the Center for the Sociology of Organizations (CSO) to devise a checklist that agency staff and experts alike could use and share when assessing risk issues. CSO had organized with AFSSET a conference on "Governing Uncertainty", which had demonstrated the wealth of social science studies available in the fields of environmental and occupational health and safety[8]. CSO, a joint CNRS-SciencesPo research unit that employs both sociologists and political scientists, is specialized in the study of organizations, public policies, markets and

[8] AFSSET, *Governing uncertainty: the contribution of social sciences to the governance of risks in environmental health*, International conference, Paris, 6-7 July 2009: http://www.afsset.fr/upload/bibliotheque/935409038664891455468866124930/governing_uncertainty_en.pdf

professions. On issues of risk and health, it has produced extensive research over the last 15 years.

The collaboration between ANSES and CSO resulted in two productions. First, CSO undertook a comparative study on the use of social sciences by European and North American agencies. Second, CSO conceived and tested a sociological checklist for the purpose of ANSES. The latter required an *ad hoc* and pragmatic approach: ANSES demanded a tool adapted to its specific needs, i.e. not a generic instrument, and easy to use by agents with no training in the social sciences. This implied a close collaboration with the agency in order to devise the checklist.

The elaboration of the list of questions composing the checklist proceeded in four phases.

1. An initial set of questions was established. The questions were listed under six headings – or sociological dimensions: 1) political and institutional context; 2) socioeconomic context; 3) forms of knowledge; 4) public arena; 5) social stratifications and inequalities; 6) scales of intervention (from local to global). These dimensions helped circumscribe the social dynamics underlying risk issues. This set of question was based on a previous sociological checklist devised in 2009 by one of the authors for HAS (*Haute Autorité de Santé*), a leading institution in the field of health in France[9]. The HAS checklist, produced by a group of sociologists, political scientists, anthropologists, economists and public health professionals, was destined for health technology assessments. The checklist for ANSES thus required an adaptation of the checklist to its specific needs and fields of intervention. Initial considerations regarding patients, for instance, were widened to cover the topic of

[9] Daniel Benamouzig, *art. cit.*, (2010).

public arenas. A heading relative to forms of knowledge was added in order to take into consideration the heterogeneity of data mobilized by the different actors when establishing relationships between health and the environment. The addition of a dimension on scales of intervention was justified on the grounds that health and environmental concerns often fall within the remit of different public authorities.

2. After discussions with agency staff, four fields were identified to test the questionnaire. The fields were meant to be representative of the different activities of the agency, both in terms of topics, and units or services. The fields chosen were: 1) animal health; 2) nanomaterials; 3) nutrition; 4) occupational exposure to pesticides. In each of these, a small number of agents were interviewed. The questionnaire covered both a description of the unit or service's activities, the types of referrals they dealt with, the social actors they interacted with (professional groups, private firms, state services, scientists, etc.) and the problems they attributed to "social" phenomena (e.g. public acceptance, role of the media, litigation, etc.).

3. Workshops by field were organized with agency staff and experts. Prior to each workshop, one or two referral(s) were examined in light of the six dimensions by the CSO team. The analysis was then presented to the workshop participants and their reactions discussed: did they consider the analysis of social dimensions inherent to the risk issue relevant and useful, or not? Did they believe such an analysis added something to both the understanding of the case and the final report, or not? Did they feel comfortable with forms of knowledge they were not familiar with, or not? Did they believe they could answer the sociological questions by themselves, or not?

One idea, implicit in the approach, was that agency staff and experts already had extensive knowledge of the social dimensions related to their domain: they knew the different actors, understood more or less their stakes and interests in the matter. But they did not consider this knowledge to be neither relevant nor useful when assessing the referral; or if they did, had no method to make this knowledge valid in their report. Hence, the goal was to suggest that answering the questions listed in the checklist did not systematically require a full sociological analysis; in fact, in most cases the knowledge was there and just needed to be recognized and formatted in such a way as to help staff and experts answer properly the question addressed by the ministries or NGOs. In some cases, though, answering the questions could reveal the need for additional research, which could be delegated either to the Social science unit or external social scientists: but this would have to prove to be useful for the end result, and not just be research for its own sake. The end result being a report that both answers the questions listed in the referral and takes into account the different publics who will use the report. Indeed, an indicator of success for the reports produced by ANSES lies in their capacity to address the concerns of different stakeholders: to achieve this, it is important that they be identified as early on as possible.

4. Based on the data collected during the interviews and the workshop, a final list of questions was established. The number of headings remained the same, but they evolved in order to take into account lessons learned during the second and third phases. In particular, the question of scales was dropped as it rarely came up as a relevant topic in discussions. Meanwhile, the construction of public problem was added as this seemed distinct from the dimension of institutional context and required a specific reflection. The six dimensions of the final checklist are the issues': 1) institutional

context; 2) socioeconomic context; 3) social practices and context; 4) problem construction; 5) forms of knowledge; 6) social inequalities. The questions within each dimension are labelled in such a way as to make sense to agents with no particular training in the social sciences.

The questionnaire was supplemented by two other documents. First, although concise, the questionnaire with its six dimensions and five questions per dimension could still scare off agency staff and experts. Accordingly, a list of ten preliminary questions requiring a simple yes or no answer was introduced at the beginning of the checklist. The first four questions relate to the referral in general and its potential for controversy and reputational risk for ANSES; the last six refer to the six dimensions of the checklist. A significant number of yeses can lead agency staff to decide to fill in the rest of the questionnaire. But if most questions end up with a no, or if the number of yeses does not seem serious enough to warrant an added investment, then the checklist can stop there. However, the preliminary set of questions was not conceived as a formal algorithm of any kind. In spite of its soft quantitative nature, it should be appreciated as a qualitative indicator for the relevance of a more comprehensive approach. In any case, what is important is that this simple exercise be completed as often as possible when a referral comes in: if only to evaluate later on if this proved to be useful or not in answering the initial request.

Second, although the dimensions and their questions are supposed to be self-explicit, it was necessary to provide a summarized state of the art in the social sciences in each of the six domains. This served two purposes. One, demonstrate the relevance of social sciences and reveal that behind each dimension there exists a bulk of available research that supports stabilized forms of knowledge; research that

can be fruitfully mobilized by agency staff and experts. Two, offer some rough elements of sociological reasoning, in order to help staff and experts understand the logics underlying the questions without having received any specific training in the social sciences.

The next two sections will present the state of the art and then provide the checklist.

III. State of the art

The entire state of the art will not be presented here due to lack of space, but its key ideas for each of the six dimensions will be summarized. The literature relates to the sociology of organizations, institutional theory, economic sociology, social movement theory, science and technology studies, interactionism, and cultural theory. The aim of the state of the art is to explore the various social dimensions underlying risk issues and to supplement risk perception and communication approaches focused primarily on the public.

Institutional context: the different institutions concerned with the topic addressed in the referral will need to be mapped out. This requires an understanding of their interests and values, along with the way they think and act. The difficulty here is that ANSES is itself a concerned institution: it is not an actor sitting outside the political context, producing science in a neutral fashion with no specific interests of its own. ANSES is an actor within the political landscape, with an interest in establishing and defending its credibility and reputation; and this requires some reflexivity on the part of agency staff and experts. Once the different institutions have been mapped out, it is necessary to identify the legal frameworks within which they operate. This gives an insight on the constraints that the institutions face. But social sciences have also taught us that

institutions operate along a set of informal rules and practices[10]. These informal rules will produce routines, which need to be analysed since the identity of an institution often rests on them. Lastly, each institution uses its own cognitive maps, ways of understanding and making sense of information it receives[11]. Hence, understanding the institutional context of a referral implies being able to account for the way in which the different institutions perceive and understand the problem, in terms of their interests and values, rules and procedures, routines and modes of interpretation.

Socioeconomic context: alongside official institutions, a range of public, non-governmental or private actors are also involved in producing, distributing, marketing, selling, controlling the different products that come under the supervision of ANSES. They may be private firms, but they can also be professional groups (veterinarians or physicians, for instance), or organizations with a surveillance function. As with institutions, once they have been mapped out it is important to retrace the legal frameworks within which they operate, the formal and informal rules they comply with, their routine procedures and cognitive maps. It is also important to analyse the relations these different actors have with each other, and how these contribute (or not) to stabilized systems, forms of cooperation and networks. Notions of power will come into play, resulting from the uncertainties that some actors control and that others value[12].

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[10] Jean-Daniel Reynaud, *Les règles du jeu. L'action collective et la régulation sociale* (Paris: Armand Colin, 1997).

[11] Mary Douglas, *How institutions think* (Syracuse: Syracuse University Press, 1986).

[12] Michel Crozier and Erhard Friedberg, *Actors and systems : the politics of collective action* (Chicago: Chicago University Press, 1980).

Identifying key uncertainties helps to make sense of the relations between the different actors, determine those who exercise influence, and identify the system within which they operate. One must also take into consideration the technologies and forms of knowledge that are being used, as these also determine the range of choices actors face[13]. In some cases, strong path dependency can characterize a given domain[14]. In others, recent innovations can increase the level of instability[15]. Finally, crises and accidents also reshape a given system of actors, providing new resources or opportunities, defining new constraints, thus altering the strategies of the different actors. Many risk objects are a result of these complex relations between different actors and their respective strategies.

Social practices and context: the topics that are assessed often refer to individual or group behaviours, particularly in terms of exposure to a possible danger (either as a consumer or a producer). Yet describing, understanding and making sense of these behaviours implies putting aside normative judgments in order to see the logic behind behaviours that may appear irrational. Often, agency staff and experts will rely on general categories – such as age, gender, social status or profession. Although useful, this may lead to errors of interpretation, linked to the belief that all members of a same category behave alike. Categories are also a source of invisibility, as they exclude individuals who may participate informally in an

[13] Giovanni Dosi, "Technological paradigms and technical trajectories: a suggested interpretation of the determinants and directions of technical change", 22-2 *Research Policy* (1982), pp.147 *et sqq*.

[14] Paul Pierson, *Dismantling the welfare state? Reagan, Thatcher and the politics of retrenchment* (Cambridge: Cambridge University Press, 1994).

[15] Richard Nelson and Sidney Winter, *An evolutionary theory of economic change* (Cambridge, Ma: Belknap Press, 1982).

activity but are not officially accounted for (e.g. illegal farm workers or farmers' spouses). Finally, the production of measures may sometimes average out extremes within the same category and prove meaningless. Hence, instead of a category, it can be sometimes be important to look for the existence of a group, with its own identity, values, set of rules and procedures. A precise understanding of a group's structure and identity can help to assess the exposure of its members. Groups have different ways of acknowledging danger and dealing with it, linked to their structure and interest in maintaining their existence[16]. Considering the existence of a group is also important because it may at some point become a collective actor intent on fighting for what it values. Aside from groups, analysing practices also implies understanding the reasons individuals have for behaving the way they do[17]. Based on the idea of limited rationality, it must be assumed that individuals make rational decisions, based on the amount of information available, the context they operate in, and the constraints they face[18]. To describe this rationality entails identifying an actor's goals, interests, resources and constraints, the context he operates in, and his ways of making sense of the information he receives. These last two elements are particularly important when assessing risk objects. Individuals have to cope with informal rules and constraints if they want to be accepted in a group and their behaviour understood by others. Often times, what can be perceived from the outside as a deviant behaviour, or an irrational

[16] Mary Douglas, *Risk and blame: essays in cultural theory* (London: Routledge, 2002).

[17] Raymond Boudon, *Raison, bonnes raisons* (Paris: Presses Universitaires de France, 2003).

[18] Herbert C. Simon, *Administrative behavior: a study of decision-making processes in administrative organization* (New York: MacMillan, 1947).

decision, makes sense once it is positioned within a set of constraints and expectations. The ways in which individuals make sense of the information they receive must also be analyzed in terms of the groups they belong to, since these act as filters, conveying information that reinforces the group's convictions, beliefs and values, blocking information that runs counter. But apart from groups, other mechanisms are at play when evaluating information, such as trust in the emitter, or the type of information emitted (abstract, neutral, general, or the opposite). All in all, this dimension stresses the importance of analyzing the contexts and groups that structure individual behaviours, in order to make sense of their practices when exposed to dangers and hazards.

Problem construction: the trajectory from a given situation to its definition as a public problem is neither linear nor simple. Numerous situations that one could judge unacceptable never qualify as problems on the public agenda; whereas those that make it do not share any common properties. Hence, it is not so much the "why" that matters than the "how": one must analyze the process that leads a situation to become an issue. Within this process, factors will help to understand how a situation became recognized as a public problem. This implies in the first place identifying the actors involved in converting a situation into a *social problem*, i.e. one that is judged unacceptable and calls for a remedy, and then into a *public problem*, i.e. one that justifies government intervention. Once the actors and their motives have been identified, their repertoires must be analyzed: what arguments do they use to make their case? What resources do they mobilize? In which arenas do they choose to intervene? Two key questions here are *problem ownership* and *problem definition*. Owning a problem allows to impose its definition: the nature of the problem, its causes and effects, who is

accountable, the solutions that are called for, and who should pay[19]. Defining a problem is never neutral; it is a contended process in which different stakeholders try to impose their conception. Problem ownership and definition must also be analyzed within specific public arenas (e.g. media, courts, parliament …), which have their own codes and procedures, for instance on how to formulate an argument or attract attention[20]. As public arenas have a limited carrying capacity, actors must struggle to impose their problems against other issues: once again, no objective characteristic can explain why some problems succeed and others fail to make it. Instead, one must analyze the strategies deployed by the problem owners and their capacity to adapt to the constraints of different arenas, in particular to format the problem's definition in such a way as to capture the interests of those in charge of the arena (e.g. journalists, judges and lawyers, members of parliament …). Another strategy consists in building alliances with other issue holders; but this will imply adapting the problem definition to fit in a wider frame of contention. What the initial owners will lose in precision, they will gain in visibility and leverage. Hence, problem definition is an ongoing process, which continues well on after the issue has made it on the agenda as actors and groups continue to struggle to impose their solutions.

Forms of knowledge: risk assessment rests on the mobilization of knowledge forms that need to be analyzed against their disciplinary backdrop. Each scientific discipline has its own way of ordering

[19] Joseph Gusfield, *The Culture of Public Problems: Drinking, Driving and the Symbolic Order* (Chicago: Chicago University Press, 1981).

[20] Stephen Hilgartner and Charles Bosk "The rise and fall of social problems: a public arenas model", 94-1 *American Journal of Sociology* 1988, pp. 53 *et sqq*.

reality, conducting experiments, producing evidence, validating its results, defining uncertainty; these must be accounted for when topics concern several disciplines that assess the risks differently. But disciplines also produce forms of invisibility, ignorance and uncertainty: it is now widely acknowledged that as knowledge progresses, so does ignorance[21]. The production of uncertainty can be unintentional: disciplines trace boundaries between the objects they purport to study and those they choose to discard, thus leaving the latter unknown; or methods to measure exposure can privilege high doses and accidental exposure, thus neglecting low doses over long periods of time[22]. But uncertainty can also be produced intentionally. In the US, an issue can be regulated only when the risk has been demonstrated and measured: accordingly, this has triggered a wide range of strategies by industrial actors to produce uncertainty in order to delay regulation[23]. In Europe, uncertainty can also be manufactured, but in this case to suggest action on the basis of the precautionary principle. Here actors will undertake to demonstrate that too many uncertainties remain around certain technologies to allow their diffusion, given their potential catastrophic and irreversible consequences[24]. In other words, the production of

[21] Scott Frickel and M. Bess Vincent, "Katrina, Contamination, and the Unintended Organization of Ignorance", 29 *Technology in Society* (2007), pp. 181 *et sqq*. Robert N. Proctor, "Agnotology: A Missing Term to Describe the Cultural Production of Ignorance (and Its Study)", in Robert N. Proctor and Laura Schiebinger (ed.), *Agnotology: The Making and Unmaking of Ignorance* (Stanford: Stanford University Press, 2008), pp. 1 *et sqq*.

[22] Jean-Noel Jouzel, *Des toxiques invisibles: sociologie d'une affaire sanitaire oubliée* (Paris: Editions de l'Ehess, 2013).

[23] Naomi Oreskes and Erik Conway, *Merchants of doubt* (New York : Bloomsbury Press, 2010).

[24] Olivier Borraz, *Les politiques du risque* (Paris: Presses de Sciences Po, 2008).

uncertainty must be analysed critically. Finally, the reflection over forms of knowledge encompasses "lay knowledge", i.e. various forms of knowledge produced by non-experts, using either conventional or non-conventional methods[25]. Although these forms of knowledge are often rejected in expert procedures, on the grounds that they have not gone through a standard process of validation, they tend to be more and more developed. Sometimes, these forms are based on the experience of individuals or groups. Other times, they are produced by groups who rely on some methods of observation, such as "popular epidemiology"[26]. Exposing and exploring the different knowledge forms can lead to a better assessment of the controversial nature of risk issues.

Social inequalities: this theme is one of the strongest possible contributions of social sciences to risk analysis. In practice, this topic can be addressed in two ways, either by analyzing vertical inequalities in terms of social stratification (such as in the case of obesity, life expectancy or the incidence and prevalence of certain pathologies); or horizontally, by identifying specific groups of the population who are exposed to equally specific dangers (for instance, workers exposed to hazardous chemicals or communities living in contaminated areas). Although the former can be quantified and may seem more objective than the latter, both imply a reference to what is considered to be normal, acceptable or average. In other words, framing a situation in terms of inequality rests on a normative argument that mobilizes both objective characterizations and more or

[25] Brian Wynne, "Misunderstood Misunderstanding: Social Identities and Public Uptake of Science", 1-3 *Public Understanding of Science* (1992), pp. 281 *et sqq*.

[26] Phil Brown, "Popular Epidemiology: Community Response to Toxic Waste-Induced Disease in Woburn, Massachusetts", 12-3-4 *Science, Technology, and Human Values* (1987), pp. 76 *et sqq*.

less implicit theories of social justice. It also requires forms of knowledge that will help "reveal" social inequalities, such as epidemiology, economics or social geography. Social inequalities can accordingly be addressed as a problem *per se*. But it can as well be viewed as a social aspect of wider considerations, when an issue tend to become highly controversial — or to remain on the contrary persistently ignored — because of its social distribution among the general population. And finally, even if claims can be heard, they will not always be acted upon: for instance, in countries such as France that put emphasis on equality of treatment by the law, revealing inequalities will not systematically lead to specific measures, since this would entail treating components of the entire population differently. In addition, while pointing to social inequalities can serve to politicize a risk object, such as in the case of environmental justice and racism[27], stressing social inequalities can also justify a medicalisation of social issues, i.e. a form of depoliticisation[28]. In other words, framing an issue in terms of social inequalities is never neutral; its consequences need to be taken into account.

IV. The checklist

The checklist is not supposed to be applied systematically to all the referrals ANSES receives. The preliminary questions, though, should be applied as often as possible, in order to determine beforehand if a case requires special attention. These can be easily answered, and

[27] Stella M. Capek (1993), "The 'environmental justice' frame: a conceptual discussion and an application", 40-1 *Social Problems* (1993), pp. 5 *et sqq*.

[28] Didier Fassin, *L'espace politique de la santé* (Paris: Presses Universitaires de France, 1996).

from there the decision to answer the rest of the questionnaire will require a judgment of opportunity based on costs (namely time). Going through the preliminary questions and the questionnaire is also a learning process: the more it is undertaken on a regular basis, the more easily agents will identify rapidly key issues that need to be looked into more in depth. They will learn to work with the checklist, adapt it to their own needs, and integrate on a routine basis forms of questioning that are inspired by social sciences. This in turn should make it easier for them to turn, either to the social science unit or to outside social scientists, for additional help when answering a question requires time, special skills or research.

The learning process also results from the fact that not one agent or expert should fill in the questionnaire on his own. It should be, as often as possible, a group activity, with staff and experts sharing information, and discussing together certain questions. And it should also be repeated during the entire referral process: although it will be undertaken at the outset, coming back to some questions later on can also prove useful, for instance in assessing the origins and validity of knowledge claims, the position of actors, or the behaviour of groups. Ultimately, the knowledge gathered should be an integral part of the final report, putting into context the risk assessment and management recommendations.

Preliminary Questions

Is a large population exposed?	Yes	No
Is the issue controversial or does it emerge in a context of social conflict?		
Could the situation undergo rapid changes?		
Is the reputation of ANSES at stake?		
Are there strong disagreements between the institutions concerned with the issue?		
Are highly sensitive economic or professional interests at stake?		
Is there insufficient knowledge regarding the practices of social groups concerned with the issue?		
Does the issue give rise to strong social movements in the public sphere?		
Is the issue characterized by persistent scientific uncertainties?		
Is the issue characterized by strong social inequalities?		

Questionnaire

1. Institutional Context

1. Who addressed the referral to ANSES? On what grounds? How have the terms of the referral changed over time? What do the institutions concerned with the issue expect from ANSES? What is at stake for ANSES?
2. What specific events led to the referral (crisis, accident, scientific publication, press release, new legal framework, court decision, stakeholder action...)? Does the issue hold any analogy with previous cases?
3. Which institutions are concerned with the referral? Which ministries? public agencies? elected officials? local governments? international organizations? Does the issue have a specific history within the administration? Has the issue already been analyzed by foreign counterparts of ANSES?
4. What are the specific interests of each institution? What are their views on the issue? What management options do they uphold? What relations do these institutions entertain between each other?
5. In what legal framework do these institutions operate (local, national, European, global)?

2. Socioeconomic context

1. Who are the economic and professional actors involved? On what scale do they operate (local, national, international)?
2. What is at stake for these actors as far as the referral is concerned?
3. What type of relations prevails between these economic and professional actors (competition, cooperation, conflict)? How could these relations best be characterized: sectorial organization, market competition, firm integration, bipartite or tripartite negotiation …?

4. Are these relations stable or on the contrary rapidly evolving? If they are evolving, are the changes due to technological innovations, crises, regulatory reform, the emergence of new players?
5. Has the issue ever been analyzed by economists? How are costs, benefits and risks shared and distributed among actors?

3. Social practices and contexts

1. Who are the social groups concerned with the issue? What is the approximate size of the population exposed?
2. What are the social practices of the groups involved? Are these social practices similar or heterogeneous?
3. What legal, economic, professional or cultural constraints shape these practices?
4. What types of knowledge do social actors base their actions upon?
5. Have these social practices ever been analyzed?

4. Problem construction

1. Beyond the institutional and economic actors identified, what other actors are concerned with the issue (citizen groups, NGOs, whistleblowers…)? What are their views on the issue?
2. What are their privileged modes of operation (protest, petitions, legal action, media activism, cyberactivism…)?
3. Could these social actors take part in the risk evaluation process in a relevant way? To what end? What would be the modus operandi of their participation?
4. Are there competing definitions of the issue? Are the causes and consequences of the issue shared? In what arenas could these aspects be debated (courts, media, parliament, internet…)?
5. Can alliances or conflicts among the different stakeholders be identified? Who are the most influential actors?

5. Forms of knowledge

1. What are the main scientific disciplines and academic communities concerned with the issue? Are their respective approaches potentially divergent?
2. Have social sciences already contributed to the production of knowledge on the issue (academic literature, conference proceedings, reports, specialized experts …)?
3. Are some data or forms of knowledge produced by non-academic actors (public reports, professional groups, field data, citizen groups, activists, non-conventional knowledge …)?
4. Are there serious uncertainties related to the issue? Are there divergent interpretations of these uncertainties? Are experts or actors actively involved in promoting these uncertainties? Are these uncertainties likely to remain over time?
5. Is the existent knowledge contended?

6. Social Inequalities

1. How are costs, benefits and risks distributed within the population? Can significant differences be observed according to revenue, status, gender, age or geographical location? Is a characterization of the issue in terms of social inequalities relevant?
2. What data can be used to characterize these social inequalities?
3. Are there severely exposed or vulnerable populations (in terms of housing, migration, physical sensitiveness, cultural differences, handicap, loneliness…)?
4. Which of these severely exposed or vulnerable populations are not represented in the public sphere?
5. What would be the effects of government decisions under scrutiny on either the reduction or the increase of social inequalities?

V. Conclusion

The checklist devised for ANSES is destined to promote and facilitate the use of social sciences in risk assessments. As agencies are confronted with ever more complex, ambiguous and uncertain issues, traditional methods of risk assessment are seen as limited and unsatisfactory: they fail to produce adequate results; they are contested in the face of growing evidence of low-dose, long-term effects of various substances and epigenetic phenomena; and they are perceived as too distanced from real-life situations. In this respect, the checklist enables to identify possible alternatives in terms of knowledge production, and to provide data on actual situations of exposure that are closer to the actual use of many substances.

Agencies such as ANSES must also learn to deal with issues that will not go away[29]: while many experts may still be convinced that in the end, scientific evidence will contribute to close controversies over GM crops or nanotechnologies, more and more policymakers acknowledge that these controversies will never achieve closure. Hence their goal is to reach a form of stabilization, in order to avoid the controversy turning into a political scandal or a perpetual source of contention. In this respect, the checklist helps to identify key stakeholders, their interests and values, and to make sense of their knowledge claims. By integrating them in the process, it is possible to achieve some form of stabilization: they will continue to disagree, but their arguments and evidence will be taken into consideration instead of being left out.

In turn, this calls for forms of expertise that are continuous, rather than punctual; and in which the different participants explore over

[29] Olivier Borraz, "From risk to the government of uncertainty: the case of mobile telephony", 14-8 *Journal of Risk Research* (2011), pp. 969 *et sqq*.

time the different dimensions of complex, ambiguous and uncertain issues as they unfold. The checklist can be useful in organising this long-term process of exploration.

Finally, as more and more groups and individuals seize situations of exposure to different dangers as opportunities to state claims, it is important for an agency such as ANSES to have the tools to analyze these phenomena and the procedures to manage such claims.

The checklist also presents some limitations, which have already been mentioned.

First, its success rests on its appropriation by agency staff and experts. Initial results show that this is possible, but not equally across ANSES. Some units are more open than others to such a line of enquiry. This is the case, unsurprisingly, of those that deal with complex, ambiguous and uncertain issues: they perceive in the checklist a way to reduce the uncertainty by integrating additional data, and to avoid a political scandal by anticipating controversial issues. Units that operate in domains that are more standardised and proceduralised see less of a benefit in introducing elements of information that have no added-value to their final decision or evaluation. But even in the case of units and services that see a potential benefit, three other limits can prevent them from filling in the checklist.

Second, processing the checklist requires time and resources. This is an obvious disadvantage in any organisation that works under time pressure. This is all the more problematic in the current context of budget cuts, limited human resources, and a tendency by supervising ministries to inundate ANSES with multiple requests, for blame-shifting purposes and to deter the agency from spending too much time on its own issues (in order to achieve greater independence). As

all services work under extreme pressure, they must be convinced that the time they invest now in the checklist can be won back later, for instance in avoiding a controversy or convincing stakeholders of the validity of the final report's recommendations. This can only be done with a success story, i.e. a case demonstrating the usefulness of the checklist in improving the quality and robustness of the final report, while avoiding media hype, social controversies or political reactions. Such a success story has yet to be written.

Third, the checklist will often render risk assessment more complex. By adding a whole new set of dimensions, it will reveal the initial problem's embeddedness in an intricate structure of social, economic and political stakes and interests. Knowledge regarding these will not always be seen as relevant by agency staff and experts when they undertake to answer the referral; and often they will be right. But in some cases it will be necessary to add new dimensions to the problem's initial framing, in order to make sense of elements that will determine the final report's reception and impact. Adding these dimensions will set off a chain-reaction: this will require expertise that is not always available in the agency, cost time in finding the right experts, and request efforts to integrate the knowledge produced with the rest of the scientific data. In some cases, social science input will be perceived as controversial, as it points to the contrasted behaviour, values and interests of competing actors. In other words, going through the checklist will inevitably run the risk of adding uncertainties, ambiguities and complexities to an issue that may already have a substantial amount of these. Once again, only by demonstrating that this will ultimately result in a more robust report can this be seen as an acceptable risk.

Fourth, the checklist does not easily fit in the process of risk analysis described by the NRC in 1983. The bulk of social science research

has underpinned the artificial nature of the boundary between risk assessment and risk management. While the authors of the 1983 report stressed the need to articulate these two moments, European authorities have often opted for a rigid separation – resting on the belief that science and society are clearly delineated. Yet most social scientists agree that such a boundary is a social construction and moreover does not withstand a close scrutiny of the behaviour of experts and policymakers alike. The questionnaire itself was established on the conviction that such a separation is essentially a myth. And clearly, going through the checklist will lead to question this distinction, thus potentially creating uneasiness among some staff and experts who still believe strongly in the distinct nature of their work; as opposed to the more political nature of the decisions made by risk managers. And even when agency staff and experts have come to accept the ambiguous nature of the distinction between science and society, they continue to rely upon it as a frame of reference for their activity. In other words, the use of the checklist runs the risk of undermining key features of the risk analysis process.

In conclusion, the pragmatic nature of this checklist must be stressed. Far from a generic, one-size-fits-all tool, derived from sociological theories and destined to assess all types of risks, it is a tool adapted to ANSES' needs and destined to answer these with knowledge available in the social sciences. Its success rests ultimately on the firm belief by agency staff and experts that introducing social sciences in their risk assessments will significantly improve the quality and robustness of their advice to policymakers.

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