Wicked and less wicked problems: a typology and a contingency framework

John Alford\textsuperscript{a,b} and Brian W. Head\textsuperscript{c}

\textsuperscript{a}Melbourne Business School, University of Melbourne, Melbourne, Australia; \textsuperscript{b}Australia and New Zealand School of Government (ANZSOG), Melbourne, Australia; \textsuperscript{c}School of Political Science and International Studies, The University of Queensland, Brisbane, Australia

\textbf{ABSTRACT}
This paper addresses shortcomings in the scholarship about ‘wicked problems’, and suggests ways of tackling them. Firstly, accounts of these problems tend to ‘totalise’, regarding them as intractable masses of complexity, so conflict-prone and/or intractable that they defy definition and solution. By contrast, we put forward a more nuanced analysis, arguing that complex problems vary in the extent of their wickedness, via such dimensions as their cognitive complexity or the diversity and irreconcilability of the actors or institutions involved. We propose a typology of different forms of wicked problems. A second shortcoming, linked to intractability, is that the favoured means of tackling wicked problems has tended towards ‘one best way’ approaches, most commonly collaboration with key stakeholders. Moreover, particular forms of collaboration tend to be routinely applied in ‘one-size-fits-all’ fashion to a variety of situations – notably with a plethora of actors, and a focus on governance rather than implementation management. We put forward a contingency framework, based on our typology, proposing which types of collaboration are suitable for which types of problem. Finally, we argue for a more realistic standard of success in dealing with wicked problems, especially the most difficult ones. To call for the ‘solving’ of these problems is to set up a standard which is not only impossible but also perhaps unnecessary. We argue that we do not so much ‘solve’ wicked problems as make progress towards improvement or towards better managing them. We spell out a more realistic version of ‘progress’.

\textbf{KEYWORDS}
Wicked problems; complex problems; collaborative governance; adaptive leadership; types of wicked problems

\section{Introduction}
Wicked problems – those that are complex, intractable, open-ended, unpredictable – seem to be proliferating. Almost every day, we hear about further complications in well-known challenges, such as global warming, drug abuse, child protection or natural disasters. We
also hear about new wicked problems that arise from developments in the social or natural world such as the safety of nanotechnology or growing numbers of refugees seeking entry to wealthier or politically less oppressive countries.

This greater salience of wicked problems could be because they have in actual fact increased in intensity and/or number. If so, we obviously need to pay more attention to how we might go about recognising, understanding and tackling them. But another possibility might be that the label of ‘wicked’ has come to be applied indiscriminately. In particular, it may be that a generic concept of wicked problems has prevailed, even though the range of concrete situations to which it has been attached vary in ways that stretch that concept. Moreover, this generic concept has in turn given rise to a ‘one best way’ to tackle problems (see for example: Dawes, Cresswell, & Pardo, 2009; Durant & Legge, 2006; Kreuter, De Rosa, Howze, & Baldwin, 2004; Morner & Misgeld, 2013), potentially creating a mismatch between the proposed ‘solutions’ and specific wicked problem situations. The net result has been a proclivity to cast many problems as more wicked than they actually are – in particular where a problem might be wicked on one dimension but not so much on others.

This paper addresses the prospect that the term ‘wicked problem’ has become inflated and over-used. After first sketching the nature and extent of wicked problems, the paper proceeds as follows. First, it identifies shortcomings in the applied scholarship to date, namely its apocalyptic or totalising frame; its related tendency to adopt ‘one best way’ responses; and its impossibly ambitious test of policy ‘success’. Second, it sketches several of the major kinds of responses to wicked problems. Third, it seeks to distinguish different types of wicked problems in a more finely grained manner as the basis for a typology, enabling further insight into the nature of the problem. Fourth, it suggests how a contingency framework might be constructed on the foundations of the typology. Finally, it argues for a more useful view of what constitutes ‘success’ in tackling a wicked problem. In the process, it sheds light on both the ‘less wicked’ problems and also on the deeply wicked ones. It focuses on the perspectives and actions of public managers or policy-makers, rather than the broad political processes of public debate and coalition-building, for the simple reason that public managers and policy-makers are the typical audience for research in policy disciplines. As an explanatory device to bridge theory and management practice, we consider the example of complex policy debates about how to control illicit drugs.

The progress of wicked problems

The ‘wicked’ problem discourse emerged in the 1970s from a critique of rational–technical or ‘engineering’ approaches to complex issues of social planning and public policy, on grounds such as their need for impossibly high levels of goal-clarity, coordination and performance information (Pressman & Wildavsky, 1973), or their neglect of the lived experiences and perspectives of stakeholders and service providers.

The best-known critique was Rittel and Webber’s ‘Dilemmas in a general theory of planning’ (1973). They took aim at ‘engineering’ approaches that tried to solve major urban and social problems. Modern society is too pluralistic to tolerate artificial solutions imposed on social groups with different attitudes and values, and this pluralism undermines the possibility of clear, agreed solutions. The finite problems tackled by science and engineering are seen as relatively ‘tame’ or ‘benign’ in the sense that their elements are definable and solutions are verifiable. By contrast, modern social problems are generally ‘ill-defined’ and resistant to
an agreed solution. They are therefore ‘wicked’, relying on political judgements rather than scientific certitudes (Rittel & Webber, 1973: 160). Many scholars have found this analysis helpful in explaining the difficulties which have plagued some areas of environmental and natural resources policy, urban and regional planning and social and health policy, with new insights as to why so many policies and programmes do not achieve their goals and have unforeseen effects (Head, 2008; Kreuter et al., 2004; Morner & Misgeld, 2013; Turnpenny, Lorenzoni, & Jones, 2009), including: poorly defined problems; problems in flux or subject to contestation; a focus on symptoms instead of underlying causes; disagreements that make possible solutions unworkable; and weak knowledge for effective implementation.

Other writers have drawn attention to related phenomena while using different conceptual language. Thus, some regarded poorly defined problems and stakeholder conflicts as evidence of ‘messy’ policy problems (Ackoff, 1974; Horn, 1981). In more analytical terms, Simon (1973) drew attention to ‘ill-structured’ problems (see also Hoppe, 2010; Mason & Mitroff, 1981). The policy literature has increasingly demonstrated that problem definition is crucial, and that every perspective about the nature of a problem tends to imply a preferred solution (eg Peters, 2005). The use of the term ‘wicked problem’ has increased in social science literature, especially since the 2000s, although not always in a discriminating manner. In this paper, we attempt to develop a more finely grained approach to identifying those features of policy problems that intensify ‘wicked’ characteristics, leading to an analytical typology that assists in the discussion of the contingent situations underlying various policy challenges.

**Shortcomings of the wicked problems framework**

The body of concepts surrounding wicked and ill-structured problems has served to draw attention to complexity in social, natural and political processes, as well as to alert us to their indefinability, intractability and entanglements. But this conceptualisation has also suffered from significant shortcomings, which limit its validity and usefulness.

First, accounts of these problems are often prone to totalising, that is, to regarding the problems as intractable masses of complexity, so conflict-prone and/or knotty that they defy definition and solution (Lazarus 2009; Stares 1996). Such accounts lean to the view that it is difficult to know where to start; or that some causal factors are hard to discern or to influence; or that goals are inherently conflictual or in some way hard to define. To some degree, this position lends comfort to those who wish to avoid grappling with such problems.

One significant consequence of this totalising approach is that it lacks a basis for breaking the problem down into smaller, more manageable parts. It is difficult, without an organising framework, both to understand the parts – and how they work – and situate them within the bigger context. In short, it lacks an analytic typology – something to which we return later in this paper.

Secondly, the temporal variant of totalising is that ‘wicked problems’ require transformational responses. This apocalyptic style of analysis describes big, fast-moving problems that require big, fast-moving solutions. There is pressure to get it right, with little time to ‘slow-cook’ small interventions. Its proponents seek a dramatic transformative intervention that settles things decisively.

A third challenge in some wicked problems analysis is that it tends to invoke a conception of ‘success’ which is almost impossible to achieve. A totalising approach implicitly posits
a binary choice between either transformative success or ongoing defeat. Because a wicked problem is seen as a tangled, tightly knit cluster of phenomena, dealing with any part of it is seen to require somehow dealing with its other parts at the same time, as a knot or a mass of difficulty. This approach therefore tends to shut out ways of recognising positive gains from various attempts to improve the situation, including incremental changes and ‘small wins’ (Weick, 1984). To call for the ‘solving’ of these problems is to set up a standard which is not only impossible but also perhaps unnecessary. We do not so much solve wicked problems as make progress towards improving them or towards better managing them (Head, 2010).

Finally, these aspects of the generic wicked problems discourse have not encouraged or facilitated thinking about degrees of wickedness. Instead, each situation has been seen in binary terms as either wicked or tame. But the fact that proponents of this generic framework refer to ‘tame’ problems as the obverse of wicked ones suggests that there may be mixed situations between these two extremes. By corollary, insufficient consideration has been given to analysing what might be the constituent elements of these problems, into which they might be decomposed for more fruitful analysis. Rather, the wicked problem remains as one big complex entity – a ‘black box’ whose inner mechanisms constitute a mystery. This complicates the design of interventions to fit the specific elements of the problem. Instead of fitting glove-like into the contours of the problem, taking account of its components, generic ‘one-size-fits-all’ interventions are likely to be poorly adapted to the subtleties of each problem landscape.

In short, while there are various strategies for dealing with wicked problems, the favoured means of tackling them each constitutes a ‘one best way’ to do so (Alford & Hughes 2008). If there is contention between alternative strategies, it is between standard solutions rather than custom-made variations.

**Strategies for tackling wicked problems**

The literature offers a variety of alternative strategies for tackling wicked problems. A well-known categorisation is by Roberts (2000), who identified three possible types of intervention: authoritative, competitive and collaborative besides traditional professional management. *Authoritative* strategies entail strong (in some versions ‘heroic’) leaders with clear directive authority. They have either assumed or been given command by followers, organisations or polities. Their ‘strength’ is based on their ability or experience in making things happen; it is mainly directed towards forging and promulgating a corporate direction or purpose, then inducing others to follow (Kotter, 1990).

Whilst this model seems to have a lot to offer in decisiveness and ‘getting on with things’ in circumstances that are often chaotic, its major drawback is that it relies on a high-calibre leader to discern the nature of the problem and devise an effective solution for it. However, wicked problems by their nature are usually beyond the cognitive capacity of any one mind to diagnose or comprehend (Heifetz, 1994), especially if they are technically complex issues. Typically, these problems also call for thoughtful analysis, dialogue and action on the part of affected stakeholders.

Roberts’ second possible approach (2000) is a *competitive* strategy: sponsoring or fostering competition between societal actors to come up with understandings of the problem and potential advances in dealing with it. The competitive dynamics of this approach have
the potential to intensify the search for new ideas about tackling the problems. But they also risk generating heightened conflict that consumes resources and delays solutions, as happens when litigation looms large.

A third strategy constitutes one kind of answer to the need for multiple inputs and insights: **public consultation** or participation in decision-making. Its rationale is summed up in the proverb that ‘many heads are better than one’. Its typical devices include wide dissemination of and access to information; public meetings; and more or less formal hearings with written submissions and interim reports. It is also very likely to entail collaborative work among organisations, public, private or non-profit (Ansell & Gash, 2008). Its problem is the opposite to that of strong leadership, in that even if the collective public was capable of uncovering and conveying the relevant knowledge, it is doubtful that it could pull this together into a coherent account (Heifetz, 1994).

Another other type of intervention is a specific variant of Roberts’ authoritative strategy: the ‘expert’ strategy, similar to the authoritative one except that the basis of the leader’s authority is expert knowledge about the problem area. To the extent that expertise can have some impact, its value derives not from being able to diagnose the problem but from understanding what questions need to be asked and investigations pursued. Again, this form of intervention suffers from the fact that, by definition, the nature of the problem is beyond the thinking abilities of even the most erudite expert. More importantly, it neglects the fact that technical expertise is not the only type of capability required. Also needed is the capacity to lead, organise and manage the implementation of responses. To expect all these qualities in one leader would be asking for a great deal indeed.

Other writers have proposed variants similar to the categories used by Roberts (such as Durant & Legge, 2006; Kreuter et al., 2004; Termeer, Dewulf, Breeman, & Stiller, 2015; Weber & Khademian, 2008); but they are prone to similar shortcomings. This analysis shows that none of these four strategies, taken alone, is likely to meet the requirements of the situation. In particular, it illustrates how the ‘one-size-fits-all’ model has bedevilled government organisations for decades (Turnpenny et al., 2009; Alford and Hughes 2008; Head and Alford 2015). Instead, this paper puts forward a typology for understanding constituent elements of a problem, and argues for a contingent approach as a more fruitful approach.

### A typology of problems

Although the great majority of the literature on wicked problems tends towards a standard model of wicked problems, inspired mainly by Rittel and Webber (1973), there are variations on that formulation, with key terms that are different but with roughly the same meanings (Ison, Collins, & Wallis, 2015). Examples are ‘intractable controversies’ (Schon & Rein, 1994); ‘unstructured’ or ‘incorrigible’ problems (Hisschemoller & Hoppe, 1995; Hoppe, 2010); ‘tangled problems’ (Dawes et al., 2009); and ‘complex problems’ (May, Jochim, & Pump, 2013). There has also been some impetus towards formulating typologies of various kinds, seeking to classify either different conceptions of the nature of the problem (eg Heifetz, 1994; Hisschemoller & Hoppe, 1995; Hoppe, 2010); varying levels of engagement of publics and the strength of institutional linkages (May et al., 2013); or the relative weight of various wickedness criteria (Turnpenny et al., 2009). Some authors have attempted to condense and simplify Rittel and Webber’s original list of 10 characteristics of wicked problems, by grouping the key ideas – for example, Head (2008) discerns stakeholder divergence, situational
complexity and knowledge uncertainty as key organising themes; Farrell and Hooker (2013) focus on three key aspects of the problem situation – finitude of knowledge and resources, complexity of linkages and normative framing of issues (see also Dawes et al., 2009; May et al., 2013; Weber & Khademian, 2008).

The endeavour to construct a typology of problems (and implied responses) can be challenging. One difficulty is how to ensure its dimensions and elements are the most relevant ones in respect of wicked problems. Here, we commence with the simple device of focusing on the two irreducible elements of wicked situations: the problem itself and the actors involved. When articulated with each other, they form a two-dimensional matrix of possibilities (see Figure 1). In this case, the matrix has only nine cells, which of course renders it vulnerable to the abstraction error mentioned above. The small number of dimensions and options cannot comprehend the intricacy and scale of a truly wicked problem. But at the same time, a radical increase in the number of elements would create a degree of complexity which may exceed even the most developed cognitive capacity. We emphasise that the categories in Figure 1 represent a spectrum or continuum rather than discrete or self-contained types.

A second difficulty relates to the quality of the nominated dimensions. Because they are usually supposed to encapsulate the field in a comprehensible number of dimensions and elements, they inevitably entail some abstraction from reality, and hence selection bias. Drawing on the literature, the framework incorporates more finely grained features within each dimension. These aspects derive from what both theoretical and empirical literatures

![Figure 1. Alternative types of complex problems.](image-url)
have identified as the key factors that underpin these dimensions. The framework does not amalgamate these factors or apply to them a common metric – which would be like trying to compare apples and oranges. Rather it provides a set of common categories for case by case analysis, ie for seeking to advance our understanding of each wicked problem in its specific terms – which is in fact the form in which they usually present themselves.

Thus, understanding a wicked problem entails a reflexive or iterative analysis (Horn, 1981; Ison et al., 2015; Rein 1976; United Nations 2007). The starting point is to formulate a working hypothesis as to where in the matrix the particular situation sits. The purpose is not to ‘solve’ the problem but to obtain an opening picture of which aspects of the situation merit further investigation. This should lead to a more nuanced analysis of problems, in which the broader categories are adjusted to take account of the sub-categories, with each problem logically situated and informed by deeper understanding of the factors underpinning their positioning as problem types. What makes this especially important is that it focuses on the phenomena we are most interested in from our vantage point of dealing with a complex problem: its underlying causes and mechanisms. As the foregoing discussion makes clear, understanding these factors paves the way for discovering methods of tackling them.

The broad matrix has two dimensions, one relating to the problem itself, the other to the people involved. These dimensions constitute merely scaffolding for ordering the more detailed dimensions. They are not meant to offer any particular insights in themselves. The vertical dimension reflects the nature of the problem, in particular its level of intractability in itself (see Heifetz, 1994; Roberts, 2000). If our general attention is on unearthing problems and their solutions, then logically there are three feasible possibilities (see Figure 1):

(1) Both the nature of the problem and the solution may be clear to the decision-makers in question. This can encompass even issues that seem at first sight to be quite complicated, such as the technical and planning challenges underpinning the construction of the Channel Tunnel between France and England. This project certainly encountered many difficulties that required enormous expertise. However, the relevant skills and resources for designing and building the tunnel were known or knowable, and were driven by two government sponsors who were committed to its success. In other words, the relevant knowledge was ‘out there’; but it required large effort to find, develop and apply it.

(2) The nature and causes of the problem may be known, but the solution is not – and indeed, it is difficult to find a sound solution owing to analytical or political complexities.

(3) Neither the problem itself nor the possible effective solutions are clearly known to the decision-makers in question (see Hisschemoller & Hoppe, 1995; Levin, Cashore, Bernstein, & Auld, 2012; van Bueren, Klijn, & Koppenjan, 2003). The war on drugs seems to be a candidate for this classification, as discussed below.

In this simple schema, the first type is the least wicked, while the third type is the most wicked.

The horizontal dimension concerns the key people – the stakeholders and their institutional context – who affect the tractability of the problem. The essential consideration here is the propensity or otherwise of those involved to enable the problem to be properly addressed (see Farrell & Hooker, 2013; and May et al., 2013). This propensity is a function of three factors. One is the locus of important knowledge about the problem (Dawes et al., 2009;
May et al., 2013; Weber & Khademian, 2008) – specifically, whether it rests substantially with the policy manager in question or is fragmented and held by multiple stakeholders. To the extent that policy managers need that knowledge in order to understand the causes of a problem and tackle them, then its fragmentation may increase the difficulty. Even in a situation of mutual goodwill, this is a problem of transaction costs, because time and effort are required to identify who has what knowledge and arrange with them to provide it. But this is also affected by a second factor: the extent to which managers and stakeholders have divergent or conflicting interests, including within each grouping (Farrell & Hooker, 2013; Kreuter et al., 2004; May et al., 2013; Weber & Khademian, 2008). The more divergent their interests, the more difficult it is for the policy managers to access that knowledge, since stakeholders may deploy their control of key knowledge in a strategic manner favouring their interests. A third factor, which in part mediates the other two, is the relative power of the policy managers and the stakeholders. If the managers lack particular knowledge held by a stakeholder who is reluctant to make it available, the managers’ chances of acquiring that knowledge would be affected, positively or negatively, by their relative power (see Kreuter et al., 2004; May et al., 2013; Weber & Khademian, 2008). Assembling these elements, three major alternatives are conceivable:

(1) The most tractable possibility is where neither knowledge nor interests are fragmented between the managers and the stakeholders, and neither has a relative power advantage. In this situation, it will be less difficult for the managers to access relevant knowledge and to reach agreements with external parties about appropriate actions for tackling wicked problems.

(2) A moderately intractable situation arises where knowledge is fragmented among various parties, and therefore takes time and effort to access, but the stakeholders are broadly in consensus or at least indifferent about the nature of the problem and the possible solutions.

(3) The least tractable alternative is where both knowledge and interests are fractured among the various actors. In this situation, not only is the relevant knowledge about the problem spread across multiple actors, each with a different part of that knowledge, but also, their interests are such that they are reluctant to share understandings with others who may be perceived as rivals.

Putting the vertical and horizontal dimensions together in their present form (Figure 1), nine possibilities present themselves as a continuum. At the bottom left corner are tame problems, for which both the problem and the solution are clear, and stakeholders readily share knowledge and have congruent interests. These conditions can apply even if the problem is multifaceted and requires large-scale organisation and expertise. At the other extreme, wicked problems are where neither the problems nor the solutions are known, and where both relevant knowledge and interests are fragmented – and this situation will be even more intractable if key conflicting knowledge-holders also have substantial power.

In between are other possibilities from moderately tame to moderately wicked, which can be discerned by seeking to calibrate where each sits on each of the dimensions. However, these dimensions can be hard to measure in themselves, owing to the well-known complexities of wicked problems. Instead, we propose some further sub-categories of our typology which refine our understanding by considering the causal factors underlying those dimensions.
One particular feature of this framework is of special interest because of the possibilities it opens up for applying a contingent approach. Specifically, it enables recognition of differing kinds of underlying causes, and therefore assists selection of more tailored ways of both comprehending and tackling them. For instance, it may emerge from an investigation of the various contributory factors that a particular problem’s ‘wickedness’ is more attributable to the problem structure than to the qualities of the stakeholders. In short, it opens up the possibility of varying our responses to wicked problems.

Towards a more finely grained typology

Thus far, we have outlined a broad typology of complex problems. However, the breadth of the typology limits its usefulness in two respects. One is that actual causes may be subsumed under the broader categories. For example, in the case of the drug problem, which is international in its scale and reach, the clarity of the problem and of its solution may provide a general picture of the issue and of the main actors, but not necessarily a clear account of key aspects of distribution chains, social structure or drug manufacturing processes. The other limitation is that it does not necessarily unearth key causal linkages among entities or phenomena that are buried within the broader ones. There is therefore a need for more finely grained categorisation. We have identified from the literature a wide array of potential mechanisms which can help provide more specific insights. But at the same time, the inclusion of all these factors in a common construct would be unwieldy, involving more than three dimensions.

Rather than try to integrate a dozen or more dimensions in one framework, we adopt a two-level framework. One level is the broad typology already described, which sets out alternative possibilities in two dimensions. The other level looks within those alternatives, to consider the factors underlying them – in particular those relevant to the practical needs of decision-makers and managers. Our method, therefore, is to conduct a multi-stage analysis – first examining the possible factors underlying the broad dimensions, drawing preliminary judgements of the extent to which the problem is wicked, then synthesising those judgements into an overall picture of degree and type of wickedness. Here, we firstly explain the sub-categories and causal factors, and how they might be used. Later, we sketch the elements of a contingency model, designed to improve the alignment of appropriate interventions with given wicked problems.

The sub-categories drawn from the literature are designed to cover all the key factors in each dimension that might shape the degree and types of wickedness in a given problem (see Table 1). The more these factors are present, the more the problem can be described as ‘wicked’. First, the vertical dimension: the problem in itself. This is basically about complexities in the technical aspects of the situation – ie the relative tractability of the objective conditions, rather than complexities to do with the stakeholders (who are considered within the horizontal (stakeholder) dimension of Table 1). The focus here concerns the inherent structure of the problem, that is, the extent to which problem clarity allows for effective interventions, without simply generating other problems. The focus is also on knowledge – that is, the extent to which the problem and its solution are in themselves understandable to a decision-maker or policy manager. This varies according to a wide range of underlying difficult features, of which we note here only a few by way of illustration. One aspect is ‘knowability’: problems are more likely to be wicked where knowledge about them is hard
to access, less visible or less tangible – in effect, where there is a deficit of knowledge. Other problems might be complicated by an abundance of information, from which the challenge is to identify and select the salient causal elements, for instance where the issue involves multiple variables and complex feedback loops. Some cases might allow the display of some key features such as their outcomes, but still leave cause-and-effect linkages or chains unexamined. Another complexity arises where it is not possible to ascertain the effective causal link without actually commencing an intervention (iterative discovery) – whereupon it may emerge that this was the wrong intervention.

The second dimension comprises stakeholders and their institutional arrangements. We argue that the relative wickedness of problems can in part be understood by reference to the key features of the stakeholder environment, foreshadowed above: knowledge, interests and power. The knowledge aspect is prone to factors which affect both the coherence and the salience of the knowledge available to decision-makers. The coherence aspect concerns the degree of fragmentation of the relevant knowledge between individuals and groups. Thus, one stakeholder may hold some of the relevant knowledge required to tackle a complex issue, but another may hold a different piece of knowledge without which the first is not very useful.

The institutional framing aspect concerns how much attention is given to the various pieces of knowledge, either by the decision-makers or the stakeholders. This will in part be a function of the volume of ‘coverage’ the issue receives, but more importantly of how its constituent elements are constructed. For example, in relation to greenhouse gases and climate change, the loss of Amazon rainforests as a major contributor to global warming is a large but regionally concentrated issue, by comparison with the more regionally diffuse but arguably a very significant role played by vehicle emissions of CO2.

The ‘interests’ factor affects the degree of conflict among and with stakeholders. To the extent that both decision-makers and stakeholders adopt different positions about the causes and solutions of problems, they are unlikely to discover ways of addressing them and even more importantly, to work together to implement the changes. Again, global warming is a classic case, not only of conflicting interests (eg oil companies vs. environmentalists) but

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**Table 1. Deconstructing the dimensions of wicked problems.**

| Basic dimension | Causal categories | More detailed dimensions | Scale of wickedness |
|-----------------|-------------------|--------------------------|---------------------|
| Problem itself  | Inherent complexity | Contradictions/dilemmas etc | Contradictions/dilemmas present = more wicked |
|                 | Remedies causing problems | | Remedies causing problems = more wicked |
| Clarity of problem | Hidden/disguised information | | Problem unclear = more wicked |
|                  | Intangible phenomena | | |
| Clarity of solution | Multiple variables | | Solution unclear = more wicked |
|                  | Iterative discovery (‘Ready, fire, aim!’) | | |
| Stakeholders and institutions (horizontal dimension) | Knowledge | Institutional framing | Extensive reframing ↔ ↑ level of attention = more wicked |
|                 | Knowledge fragmentation | | High knowledge-fragmentation = more wicked |
| Interests       | Interest differentiation/conflict | | High interest differentiation/conflict = more wicked |
| Power           | Stakeholder power-resources | | High stakeholder power resources = more wicked |
|                 | Enablers/constraints | | More substantial enablers/constraints = more wicked |
also cross-cutting ones (e.g. China’s need for economic growth vs its need to abate widespread dense smog).

Finally, the power factor distorts, mediates and bridges the impact of the other factors. To the extent that either the decision-maker or the stakeholder has power, the interest differentiation to which they contribute will be more significant than that of other parties. This power is in turn a function of both an ‘internal’ and an ‘external’ condition. The internal one is the set of capacities (or ‘power-resources’) the actors hold, such as money, positional power, legitimate authority, expertise or whatever (French & Raven, 1959; Lukes, 2005). The external condition is the context (or ‘power-terrain’) in which the actors operate, which affects the impact of its power-resources and its ability to wield them. The availability of resources, and willingness to deploy them, makes a difference. Thus, technical challenges on a grand scale, requiring significant funding, high innovation and managerial skills – such as the NASA project to ‘put a man on the moon’— might turn out to be more feasible for rich countries than resolving some of the complex social problems of our large cities (Nelson, 1974).

Bringing all these dimensions and categories together, we can incorporate more specific causal factors, without paralysing the analysis through balancing an unmanageable number of variables. Thus, a problem is more likely to be wicked if several conditions (or most of them) are present:

- **Structural complexity**: inherent intractability of the technical (i.e. non-stakeholder-related) aspects of the problem.
- **Knowability**: Not only is there little knowledge about the issue, but the nature of the problem or its solution is such that it is *unknowable* – that is: the relevant information is hidden, disguised or intangible; it comprises multiple complex variables; and/or its workings require taking action to discover causal links and probable outcomes.
- **Knowledge fragmentation**: the available knowledge is fragmented among multiple stakeholders, each holding some but not all of what is required to address the problem.
- **Knowledge-framing**: some of the knowledge receives either too much or too little attention because of the way it is framed, thereby distorting our understanding.
- **Interest-differentiation**: the various stakeholders have interests (or values) which are substantially in conflict with those of others.
- **Power-distribution**: There is a dysfunctional distribution of power among stakeholders, whereby very powerful actors can overwhelm less powerful ones, even if the latter constitute a majority consensus; or whereby sharply divided interests are matched by sharply divided power.

By contrast, a problem is more likely to be tame if it is knowable, the knowledge is publicly shared or accessible, there are no deep conflicts of interest among stakeholders, and power is well distributed. In between tame and very wicked problems, there are other problem types which will vary in their degree of difficulty to the extent that the above conditions are moderated. Most importantly, they may vary in their type of difficulty, holding open the possibility of adjusting interventions to suit the particular type.

### Applying the typology to the ‘war on drugs’

The above analysis provides the basis for a contingency framework – that is, of moving from a ‘one-size-fits-all’ model to one where the choice of intervention type depends on and fits with the circumstances. While space precludes a full specification of such a model for this
The example of formulating and implementing policies to control illicit drugs is highly complex (Dorn & South 1990). Its complexity rests on three factors that also make it a wicked problem. The first is addiction, meaning that interventions assuming rational choice on the part of drug abusers are ineffectual or counter-productive. The second is the criminality of the drug trade, which means that many of its actors and processes operate ‘underground’, so that it is difficult, if not impossible, to gather comprehensive evidence, apply interventions or monitor their effects with any clarity. These two factors counteract each other, in that the addictive nature of drugs makes legalising them perilous, while outlawing them reinforces the dangers of the drug trade. The third factor is the multifarious nature of drug production and distribution. Hard drugs are produced in non-metropolitan countries, such as Afghanistan or Colombia, and distributed through vast networks crossing many countries, all outside the direct control of the United States or Europe where they are mainly consumed. In drug-consuming countries, distribution networks have bases in differing ethnic communities and social groupings (Kleiman & Smith, 1990).

One major intervention, popular among politicians seeking to project an image of ‘strong leadership’, is deterrence – increasing either the penalties or enforcement efforts against illicit drug use. This assumes that drug users rationally weigh the expected enjoyment from the drug against the severity of the penalty and the likelihood of being caught – a dubious assumption for addicts. The research evidence shows clearly that deterrence is generally ineffective, if not counter-productive when banned substances are seen as attractive ‘forbidden fruit’ (MacCoun, 1993; Weatherburn, Topp, Midford, & Allsopp, 2000).

A second strategy is market disruption – applying law enforcement to interdict drug supply. While this is seen as a vital strategy in every country, its effectiveness is inconclusive (Marks, 1990). Major drug seizures represent only a fraction of the total traffic, the flow of which is abundant and in any case clandestine and hence not measurable (Weatherburn et al., 2000). More seriously, such interventions may increase drug prices and redouble the efforts of surviving drug dealers. Efforts to heavily repress drug dealing activities in some localities may serve to displace the problem to other places.

A third strategy is to rehabilitate drug users through legally mandated treatment, as when a judge requires an offending addict to undertake a methadone programme as an alternative to prison. The research tends to suggest that this can be relatively effective in getting addicts off drugs (Anglin, 1988; Brecht, Anglin, & Wang, 1993; Mendes & Rowe, 2004), but it is by its very nature applicable to only a minority of affected people. By definition, only those who have been caught abusing drugs can be subjected to this method, and only some of them are actually treated in this way.

Another strategy to deal with some of the adverse health effects of drug use, especially heroin, is harm minimisation, which entails accepting that addicts will inevitably consume drugs, in particular with needles, and seeks to minimise the danger of infection or overdose by providing for safe injection houses or needle exchanges. Critics of this approach point out that it may serve to make drug use easier and therefore more persistent.

Finally, some argue for strengthening primary prevention strategies, most commonly drug education of one kind or another. Some programmes in particular take into account young people’s developmental context and experiences, and seek to address the social precursors to drug use, such as troubled family life, low self-esteem, poor schooling. But in general
the research indicates that for these programmes to be effective, they need to reinforce the work of professional drug educators with involvement from schools, parents and the community (Dusenbury & Falco, 1995). In some cases, the very factors that fostered drug abuse, such as family breakdown, may also mean that these other parties, such as parents, may be unable to contribute. Moreover, the chains of cause and effect between programmes and behaviour are not well understood, and prone to external influencers. Lastly, as Boyum and Reuter (2005) observe: ‘… one has to wonder whether programs aimed at the entire child and adolescent population are an efficient way to reach the small minority who will become heavy users …’ (2005, 92).

This issue clearly qualifies as a wicked problem. At its heart lies an inherent structural complexity: addiction, which tends to rule out any solution designed to appeal to the rational interests of addicts. This feature also makes some interventions counter-productive, for instance, where a major drug seizure raises prices and prompts dealers to redouble efforts to take over market share from others. As ongoing debates around this issue attest, there are contending views about how people become addicts and the place of personal responsibility for self-harming decisions. This, combined with the hidden nature of the drug trade and its international reach, mean that neither the problem nor the solution can be clear. At the same time, the prominent role of drug cartels and gangs virtually guarantees that there will be both knowledge fragmentation and interest differentiation, as manifested both by internecine struggles for power among drug syndicates but also by terms like the government’s ‘War on Drugs’.

The case for conceiving of drug policy as a wicked problem is very strong. Such examples help us come to terms with the degree of difficulty in tackling wicked problems. They also help us to identify which particular aspects of the problem are more deserving of our attention, and what kinds of intervention might be effective.

Elements of a contingency framework

This paper has put forward a typology of complex problems which is more detailed than other typologies, and suggested its use as a framework for a contingent approach to dealing with wicked problems. It has also noted some standard responses to wicked problems (such as authoritative leadership and public consultation) as illustrations of actual practices. We now put these aspects together as the basis for a contingency framework, using the drugs case to explain it. The rationale of this analysis is to acknowledge that wicked problems come in various shapes and sizes, each requiring a particular handling. The purpose has been to identify these differences more precisely than those offered in the previous literature and even in the matrix put forward above. This entails consideration of each problem case in terms of the causal factors, enabling an assessment not only of the extent to which it is ‘wicked’ but also, and most importantly, of the type of complexity in that case. That is important because it then informs what kind of intervention should be tailored to deal with the problem. It is also important to understand that for decision-makers, this entails making a judgement on how to handle an issue, rather than pretending the decision can be ‘read off’ or derived from a precise scientific estimate.

Table 1 has proposed the main causal linkages for each category, from which the particular extent and variety of incidence of complexity can be inferred, and therefore the appropriate set of interventions. In relation to drugs policy, it is evident that this is quintessentially
wicked. It is one in which the experts, not to mention the political leaders, have trouble framing or agreeing on causes and solutions. There is also wide (and sometimes deadly!) disagreement stemming from different interests coming into contact. Particularly difficult is the fact that any one ‘solution’, if implemented, tends to generate other counter-acting pressures, for example, when ‘harm minimisation’ gives undue comfort to dealers and addicts.

On the basis of this analysis, there is a case to be made in the area of drugs policy for adopting – and hopefully improving upon – public consultation and participation, but also some supportive and facilitative tasks alongside that process. The drug issue needs to mobilise large numbers of people, not only in identifying the problem and developing solutions, but also in implementing them (as was found with the HIV/AIDS in earlier decades). This participation is important not only to mobilise the combined knowledge of those involved, but also to attract and maintain support. However, while public participation is a necessary condition for tackling the drug problem, it is not a sufficient one, since it is necessary to juggle the difficult imperatives posed by addiction and crime. Nevertheless, this approach is far preferable to authoritative leadership, which in its more aggressive versions tends to aggravate the problem rather than attenuate it, as when periodically a ‘War on Drugs’ is sponsored by the White House. The essential point here is that proposed interventions need to be aligned with the circumstances in which they apply. Failure to do so can lead not only to lack of success but also to actual misfortune.

**Conclusion**

The perception of a problem as an indivisible ‘mess’ of complexity entails that it is not possible to align feasible and legitimate solutions to the problem itself. This totalising perspective on the problem means that any solution is likely to be misaligned, and even contradictory or irrelevant. However, the situational contingency framework we have outlined also suggests a way of making some headway against this difficulty. Specifically, to the extent that it is possible to recognise types of complexity and diversity, it is also easier to apply different interventions (or non-interventions) to different parts of the problem. The targeted interventions this makes possible could enable more congruence between the problem and the net benefits of the proposed interventions. It is also possible to employ a more ‘mindful’ approach to ‘stopping rules’, seeing them as formulated from judgements about how much progress realistically needs to be made regarding each aspect of the problem. Our argument is that improvements can indeed be achieved. Moreover, the public participation approach may also add something to the process of defining ‘success’, in that those involved can exercise great control over the definition of success, and are therefore in a better position to trade off different costs and benefits in a way which makes progress in the face of intractability.

If there is no ‘root cause’ of ‘wickedness’, there can be no single best approach to tackling such problems. If, for example, it is claimed that the fundamental cause of wicked problems is lack of scientific knowledge (eg about climate change), this claim already implies a solution – more scientific research to reduce uncertainty and to convince those who are sceptical of the mainstream science consensus. On the other hand, if the fundamental problem is seen to be divergence of viewpoints, the implied solution is to establish processes of inclusive participation that can lead towards a workable consensus.

The term ‘wicked problems’ has been bandied about indiscriminately by some public officials and scholars. Some of them use it to describe situations which they effectively
over-estimate: problems which might be somewhat complicated in conventional terms, but not in fact wicked, as exemplified by large engineering projects like the Channel Tunnel. Others use it to describe problems that are in fact wicked, but from varying perspectives about policy implications. Of these, the more pessimistic overestimate the difficulty, seeing these problems as insuperable and therefore in the ‘far-too-hard’ basket. Others acknowledge the intractabilities, but nevertheless err on the side of optimism, assuming these problems are susceptible to the usual mix of rational understandings, organisational routines, coor-
dination systems and databases.

We have argued that a key obstacle to making progress with intractable problems has been the tendency for some analysts and practitioners to act as if wicked problems were all the same in both the type and extent of their ‘wickedness’, and therefore apply ‘one-size-fits-all’ approaches to all of them. The result is that any single problem situation has little chance of being addressed effectively. By contrast, we argue that a more contingent approach is necessary, and we have put forward a typology to enable distinctions to be drawn between different forms of problems. While this in itself will not solve problems, it can assist the identification and adoption of appropriate interventions based on more knowledge and experience of the issues and better relationships among key participants.

Acknowledgements

The authors thank the anonymous reviewers of Policy & Society, together with the various discus-
sants on previous versions of this paper, presented at the ICPP in Milan, July 2015 and the IRSPM in Hong Kong, April 2016.

Disclosure statement

No potential conflict of interest was reported by the authors.

Notes on contributors

John Alford is a professor of Public Sector Management at the Australia and New Zealand School of Government and the University of Melbourne. His book Engaging Public Sector Clients won the American Society for Public Administration best book award in 2011, while his Rethinking Public Service Delivery (with Janine O’Flynn) was named best public sector book by the Academy of Management in 2014.

Brian Head is a professor of Public Policy at the University of Queensland, and has also held senior roles in government. He has published widely on evidence-based policy, collaborative governance and wicked problems. He is currently applying these frameworks for analysing several fields of policy studies.

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