

Chapter 5

Public perspectives

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Chapter overview

In this Chapter we consider the role of non-specialists in the shaping of emerging biotechnologies, in particular through deliberate public engagement on the part of researchers and policy makers.

We examine the aims of public engagement and distinguish normative, instrumental and substantive rationales for public engagement. We then suggest reasons why public engagement might contribute to more robust public decision making with regard to emerging biotechnologies.

We survey the modes and methods of public engagement, drawing attention to the need to tailor the method to the specific context and the fact that all methods have both advantages and limitations. Crucially, these perceived pros and cons also vary with the underlying purposes attributed to public engagement, such that designs are also always to some extent political – and themselves require open deliberation. Nevertheless they may all contribute to an ecosystem of engagement which has positive benefits.

We then set out a number of dilemmas that arise within public engagement. These include: the implications for engagement under upstream conditions of high uncertainty; the significance of – and attempt to attach a democratic value to – consensus among a small group of non-specialists; the need to be independent of policy process and yet contribute to it; the balance between informing views and eliciting them; the frequently top-down and invited nature of public engagement; and the argument that market signals provide more authentic information than limited public engagement.

Finally we address the question of why science and technology, and biotechnology especially, should require public engagement more than other areas of policy, concluding that there are institutional features of the governance system for science and technology that make it particularly appropriate.

Introduction

- 5.1 As we have characterised them, emerging biotechnologies are shaped by a complex variety of hard and soft conditions (from physical laws to influential personal enthusiasms). Many of these conditions are set in place as a result of the decisions or dispositions of a range of individuals, social groups or institutional bodies ('actors'). Different actors may bring to these decisions different understandings of what is at stake and what is desirable (an expert may represent a technical understanding, an industrialist an understanding of market economy, an ethicist an understanding of moral values, etc.). But even a single individual contemplating a practical decision – a politician, for example – may need to resolve different perspectives that co-exist for them as an office holder, a member of a social group, a scientist, a parent, a patient and so on. As we observed in the previous Chapter,²⁹⁷ questions of practical action involve a variety of these sources of normativity and cannot be reduced to exclusively technical, social, or moral questions. Addressing all such questions therefore requires finding the appropriate conditions of engagement between these normative influences.
- 5.2 In this Chapter we consider methods by which decision makers engage with actors who are not professionally involved in policy and governance, as bearers of a broader range of normative perspectives. As a tool for operationalising public discourse ethics, 'public engagement', implying the engagement between those accountable for a given range of practical decisions and those who have a public interest in their outcomes, is neither necessary nor sufficient for ethically robust decision making but it may contribute both positively and, occasionally, negatively to this, depending on how it is used.
- 5.3 The perceived importance of public engagement undoubtedly rises where there is acknowledgment of uncertainty and ambiguity. The presence of these characteristics implies that contrasting perspectives are possible on what count as relevant frameworks for ethical decision making in the first place. How such engagements are framed is at least as important as who is involved and, indeed, whether they occur at all.
- 5.4 The difficulties of reaching decisions for society, formidable though they are, do not mean that no common ground is possible. It might be found more easily, however, if impossible standards

²⁹⁷ See paragraph 4.34ff.

are not set at the outset. For example, we should not expect to discover a single, ideal process through which an enduring consensus can be reached on matters of public ethics. Worries and uncertainties are likely to persist, ambiguities will remain, and scepticism and dissent is not only inevitable, but healthy and productive.

- 5.5 An ethically robust research and innovation policy should seek to understand the reasons that underpin different and competing responses to emerging biotechnologies. This is the aim of many exercises in public engagement around different emerging biotechnologies. This Chapter will therefore consider the various ways in which such engagement may help to shape emerging biotechnologies and responses to the benefits and hazards they hold.

The Public, publics and public perspectives

- 5.6 In this Chapter we deal with the roles of social actors who are not recognised or involved as specialists in any of the key contexts that frame understandings of emerging biotechnologies. These include relevant interest and user groups (for instance patients, workers, consumers, or local communities), wider civil society organisations and social movements (like political parties, environmentalists, unions and faith groups), other affected businesses and agencies, as well as citizens in the most general sense. No matter how remote they are from those who exercise power within the innovation systems in question, all such social actors may hold legitimate interests in the possible outcomes and can play a role in shaping emerging biotechnologies for public good. It is typically in civil society, after all, that normative frameworks first emerge, which later come to be adopted by the institutions that shape research and innovation systems, and even by commercial firms.²⁹⁸
- 5.7 A term often used for the broadest level of aggregation of these non-specialists is ‘the Public’. This term evokes both the agglomeration of diverse social interests and perspectives, as well as the open public arena within which they are expressed.²⁹⁹ The use of the singular term ‘the Public’ should not be taken to imply homogeneity. Indeed, grouping together diverse perspectives in this way risks effacing the very diversities that are so crucial to understanding the frames that account for the appearance and disappearance of uncertainty, ambiguity and transformative potential in discourse on emerging biotechnologies. The use of the singular definite article also suggests that *the* Public exists in a sense that independent of the issues in question. In very real senses, however, it is often the other way around.³⁰⁰ Many social scientists and public engagement practitioners therefore prefer the plural term ‘publics’.³⁰¹ Recognising that these terms *are* contested, we refer to this collection of disparate interests and values as ‘public perspectives’.
- 5.8 It is important to recognise that public perspectives may inform policy and governance of emerging biotechnologies in a variety of ways other than by deliberate attempts to engage them. Indeed, anticipations or presuppositions about the balance of public opinion may be hugely influential and energetically disputed even in the absence of an attempt to explore those

²⁹⁸ One example is the value of ‘sustainability’ – see paragraphs 4.31 and 4.32.

²⁹⁹ The importance of the public sphere, as distinct from that of political administration, originates historically in the Enlightenment, when national policies began to have significance for the wider population, in particular the literate bourgeoisie, through the growth of organised industry and trade (including international trade). As a result, information about the state’s activities and an ability to influence these grew in importance, and was served by the contemporary growth of media (such as pamphlets and newspapers). See: Habermas J (1962) *The structural transformation of the public sphere: an inquiry into a category of bourgeois society* (Cambridge, Massachusetts: MIT Press, 1991; translated 1989). The ‘public sphere’ of the 19th Century was, of course, still exclusive of those such as the poor, women and the illiterate. Habermas regards it as one of the failures of the Enlightenment project that the public sphere subsequently declined into a sphere of minority sectional interests with a complacent majority, public information into journalism and publicity, and political participation into market capitalism.

³⁰⁰ Dewey J (1927) *The public and its problems* (Athens, Ohio: Ohio University Press, 1989).

³⁰¹ See, for example, National Co-ordinating Centre on Public Engagement (2012) *Who are the public?*, available at: <http://www.publicengagement.ac.uk/what/who-are-the-public>.

perspectives directly through engagement.³⁰² Insofar as these have their roots in actual public perspectives, they may be mediated (and also selected, interpreted, parodied or resisted) through a variety of channels, including the established media that work alongside, or as alternatives, to deliberate engagement.

The role of the media and the engaged public

5.9 People require information if they are to become engaged meaningfully in discourse in the public sphere. In the first place, they need to become aware of biotechnologies and the discourse around them, then they need information that allows them to participate in this discourse. They may receive this through various public media. Some people – including some of those who are recruited into public engagement exercises – may become engaged despite little direct prior familiarity with biotechnologies.

The media and the public

5.10 In order to understand the role of the media – by which we mean the mass media and media targeted towards interested non-specialists – as enabling or constraining public discourse, we need to ask several questions: first, where those who are not already professionally engaged with biotechnologies receive their information; second, the extent to which the media influence their opinions about biotechnologies; and third, how the media itself is influenced in terms of how it selects (or deselects) and presents the information it publishes. At a more general level, understanding the effect of the media may also contribute to understanding the processes of discursive closure and lock-in discussed earlier and also to identifying opportunities to ‘open up’ reflection and debate in the public sphere.

5.11 It is a common premise in communication studies that the media have significant effects on public opinions.³⁰³ Despite the stability of this premise it is surprisingly hard to find evidence of the range and relative importance of sources of information about biotechnology used by non-professionals, although it is probably safe to conclude that much of it comes via public media³⁰⁴ that are increasingly modulated by online sources such as websites, forums or blogs. It is similarly difficult to find evidence that sheds clear light on the way in which, and the extent to which, mass media influence the qualitative nature of public opinions. One relevant programme of research is cultivation analysis, which studies the long term effects of exposure to media portrayals – in particular television – on people’s perception of social reality. Evidence from cultivation studies in the US concludes that there is a measurable cultivation effect in relation to attitudes towards science.³⁰⁵

5.12 Given that there is a link between controversies in biotechnology and higher levels of public awareness about biotechnologies³⁰⁶ it seems clear that the media are capable of focusing and amplifying public reactions, although assessing the extent to which they qualitatively influence

³⁰² For example, in relation to genetic modification, certain decisions have been taken not to pursue GM food trials (or sales) because of public opinion and direct action groups, both at the industry level and at the governmental level. See: Hickman L (2012) GM crops: protesters go back to the battlefields *The Guardian* 22 May, available at: <http://www.guardian.co.uk/environment/2012/may/22/gm-crops-protesters-battlefields> and Randerson J (2012) The GM debate is growing up *The Guardian* 30 May, available at: <http://www.guardian.co.uk/commentisfree/2012/may/30/gm-debate-grown-up>, for discussion of how public opinion influenced GM crop use in the UK and how the debate has changed since the late 1990s and early 2000s.

³⁰³ See, for example, the observation that “The entire study of mass communication is based on the premise that the media have significant effects.” McQuail D (1994) *Mass communication theory: an introduction*, Third Edition (Thousand Oaks, California: Sage) quoted in Scheufele DA (1999) Framing as a theory of media effects *Journal of Communication* **49**: 103-22.

³⁰⁴ See, for example, Gerbner G (1987) Science on television: how it affects public conceptions *Issues in Science and Technology* **3**: 109-15, where it was stated that “From our ongoing research project, called Cultural Indicators, we know that most U.S. citizens encounter science and technology most often on television.”

³⁰⁵ “The more people watch television the less favourable they are about science.” Ibid.

³⁰⁶ See: Gaskell G, Stares S, Allansdottir A, et al. (2010) *Europeans and Biotechnology in 2010: winds of change? A report to the European Commission’s Directorate-General for Research*, available at: http://ec.europa.eu/public_opinion/archives/ebs/ebs_341_winds_en.pdf and Gaskell G, Allum N, Bauer M, et al. (2003) *Ambivalent GM nation? Public attitudes to biotechnology in the UK, 1991-2002*, available at: http://ec.europa.eu/research/biosociety/pdf/ambivalent_gm_nation_uk.pdf.

those opinions is less straightforward. Academic research on media effects has itself adopted and rejected a number of models in its comparatively brief history. Early research was dominated by the experience of propaganda in the Second World War and was characterised by concern over the apparent power of direct media effects on public opinion. However, this model gave way to a second stage (to the late 1960s) which saw media as essentially reinforcing existing attitudes rather than actively changing them. Subsequent research (particularly in the 1970s) has examined the cognitive effects of media presentation on beliefs, understandings and memories and to the way in which public opinion and media choices influence each other as a system, or as part of a system involving other influences besides.³⁰⁷ Internet-enabled social networking is doubtless now one of these influences, and one that will further confound any attempt to explain media effects in terms of simple causes, and therefore to control them.

- 5.13 Despite the changing tides in scholarship about the way media influence public opinion generally, comparative studies of North American and European media show a consistent correlation between the respective media cultures and public opinion in the regions in which they predominate.³⁰⁸ News media are more often expected to be objective and balanced in North America but are understood to be more opinionated in Europe,³⁰⁹ correlating with greater levels of public controversy over biotechnologies in Europe than in North America³¹⁰; however, the reasons for this correlation are apparently complex (going beyond the binary relationship between the media and public and making it difficult to identify what produces the correlation).³¹¹

Power and the media

- 5.14 What seems clearer than the influence of the media over public opinion is the influence sectional interests are capable of exercising over the media. Sectional interests may exert influence by controlling what information gets published in the first place. This can effectively keep discourse on biotechnology policy, in which there is a public interest, out of the public sphere. Such cases have been described as “uncontroversies” and “nondecisions”.³¹²
- 5.15 Research has shown that, during the last three decades of the 20th Century, framing in the US media of issues associated with biotechnology (e.g. *in vitro* fertilisation, genetic engineering, stem cells, gene therapy, and cloning) was dominated by certain powerful media outlets and sectional interests.³¹³ Views that diverge from the official or orthodox can be erased progressively from public discourse through a “spiral of silence” that socially marginalises those

³⁰⁷ Scheufele DA and Tewksbury D (2007) Framing, agenda setting, and priming: the evolution of three media effects models *Journal of Communication* 57: 9-20; Scheufele DA (1999) Framing as a theory of media effects *Journal of Communication* 49: 103-22.

³⁰⁸ Gaskell G, Einsiedel E, Priest S *et al.* (2001) Troubled waters: the Atlantic divide on biotechnology policy, in *Biotechnology 1996-2000: the years of controversy*, Gaskell G, and Bauer MW (Editors) (London: Science Museum).

³⁰⁹ That is to say, news media in Europe are often assumed to have an overt political stance acting as a lens through which their news and editorials are presented (and understood), while in North America the expectation is more often that the media report newsworthy occurrences in as neutral a manner as possible, with the political view of the organisation only showing through in the ‘op-ed’ sections of its output. The extent to which this is actually the case is, of course, open to debate.

³¹⁰ However, Gaskell *et al.* contest that conclusions based on this may be attributable to third person effects where people are predisposed to *overestimate* the effects of media on persons other than themselves and they “question explanations which rest on widely discredited theories of strong, direct and uniform media effects on news consumers”. *Ibid.*, p103.

³¹¹ Gaskell G, Einsiedel E, Priest S *et al.* (2001) Troubled waters: the Atlantic divide on biotechnology policy, in *Biotechnology 1996-2000: the years of controversy*, Gaskell G, and Bauer MW (Editors) (London: Science Museum), p113.

³¹² Nisbet MC and Lewenstein BV (2002) Biotechnology and the American media: the policy process and the elite press, 1970 to 1999 *Science Communication* 23: 359-91. The examples given are the reformulation of US federal biotechnology regulation to the advantage of industry in the late 1980s and the lack of attention given to the large amount of biotechnology research with military applications funded by the US Department of Defense.

³¹³ *Ibid.*

who express dissenting opinions.³¹⁴ This is observed despite the US media's vaunted culture of objectivity.³¹⁵

- 5.16 What is particularly stark in the US experience is how interests compete to control the media portrayal of the issues in ways that strategically advantage those who have a vested interest. Furthermore there is an identifiable hierarchy of influence, at the apex of which is government, followed by industry and trusted professions, followed by civil society groups that have become adept at using publicity methods arising in commercial marketing. The goal of this competition is always the eradication of ambiguity and the assertion of one view as official, or right-thinking, while delegitimising dissenting perspectives.³¹⁶ Alignments between industry, policy makers and scientists were most effective, for example, in securing public support for agricultural biotechnology as a solution to declining farm incomes, beguiling investors during the early 1980s with upbeat press releases and optimistic government reports into believing biotechnology offered a new kind of blue chip stock.³¹⁷ On the other hand, controversy surrounding biotechnologies has surfaced at rare points, when dissenting voices were able to find expression through the media (two points noted in the US were around the wider implications of recombinant DNA and human cloning³¹⁸). Despite the divergences in journalistic culture, and the greater frequency of reporting of controversy in Europe, research has still found scientific, industrial and political elites dominant in setting the news agenda and content in the UK and Germany as in the US.³¹⁹
- 5.17 The partial framing of biotechnology issues by the media need not be deliberate. It may also stem from the "shared culture" of scientists and science journalists who are often themselves scientifically trained and may see themselves as bridging the professions of science and journalism.³²⁰ However, another perspective on this is offered by a study of the perceptions scientists and journalists have of media reporting of biotechnology.³²¹ The study found a dissonance between the views of the two groups: while both agreed that reporting should be sober and measured, perceptions of actual reporting differed, with scientists, unlike journalists, tending to view it as too sensationalist and focused on risks.
- 5.18 As we acknowledged in Chapter 2, framing is a necessary part of the process of reducing the complexity of an issue in order to communicate what is significant about it to non-specialists. This is particularly the case given the constraints, in terms of time or space, of news media.³²² In the presentation of biotechnologies in the media a number of distinct framings have been identified,³²³ each of which attends to different aspects of significance.

³¹⁴ See: Noelle-Neumann E (1993) *The spiral of silence: public opinion – our social skin* (Chicago, Illinois: University of Chicago Press).

³¹⁵ A noted paradoxical result of the US media's culture of striving for 'balance' was the undue prominence that climate change scepticism continued to receive despite a stable and widespread consensus on this issue. See: Gaskell G, Einsiedel E, Priest S *et al.* (2001) Troubled waters: the Atlantic divide on biotechnology policy, in *Biotechnology 1996-2000: the years of controversy*, Gaskell G, and Bauer MW (Editors) (London: Science Museum), p9.

³¹⁶ Nisbet MC and Lewenstein BV (2002) Biotechnology and the American media: the policy process and the elite press, 1970 to 1999 *Science Communication* **23**: 359-91.

³¹⁷ We discuss the 1980s 'biotechnology boom' in Chapter 9. See paragraph 9.5.

³¹⁸ Bioethicists have also understood the importance of influencing the news agenda with some success: see Nisbet MC and Lewenstein BV (2002) Biotechnology and the American media: the policy process and the elite press, 1970 to 1999 *Science Communication* **23**: 359-91.

³¹⁹ Listerman T (2010) Framing of science issues in opinion-leading news: international comparison of biotechnology issue coverage *Public Understanding of Science* **19**: 5-15.

³²⁰ Nisbet MC and Lewenstein BV (2002) Biotechnology and the American media: the policy process and the elite press, 1970 to 1999 *Science Communication* **23**: 359-91, p366.

³²¹ Gunter B, Kinderlerer J and Beyleveld D (1999) The media and public understanding of biotechnology: a survey of scientists and journalists *Science Communication* **20**: 373-94.

³²² Scheufele DA and Tewksbury D (2007) Framing, agenda setting, and priming: the evolution of three media effects models *Journal of Communication* **57**: 9-20, citing Gans HJ (1979) *Deciding what's news* (New York: Pantheon Books).

³²³ Durant, Bauer and Gaskell, for example, develop a typology of eight framings (Durant J, Bauer MW and Gaskell G (1998) *Biotechnology in the public sphere: a European sourcebook* (London: Science Museum)) cited in Nisbet MC and Lewenstein BV (2002) Biotechnology and the American media: the policy process and the elite press, 1970 to 1999 *Science Communication* **23**: 359-91; Listerman identifies five framings (Listerman T (2010) Framing of science issues in opinion-leading news: international comparison of biotechnology issue coverage *Public Understanding of Science* **19**: 5-15); Nisbet, Brossard and Kroepsch identify 11 in relation to the media presentation of controversy relating to stem cells (Nisbet MC,

Box 5.1: A framing typology for biotechnology

- *Progress*: celebration of new development, breakthrough; direction of history; conflict between progressive/conservative-reactionary
- *Economic prospect*: economic potential; prospects for investment and profits; research and development arguments
- *Ethical*: call for ethical principles; thresholds; boundaries; distinctions between acceptable/ unacceptable risks in discussions on known risks; dilemmas. Professional ethics.
- *Pandora's box*: call for restraint in the face of the unknown risk; the opening of flood gates warning; unknown risks as anticipated threats; catastrophe warning
- *Runaway*: fatalism after the innovation; having adopted the new technology/products, a price may well have to be paid in the future; no control any more after the event
- *Nature/nurture*: environmental versus genetic determination; inheritance issues
- *Public accountability*: call for public control, participation, public involvement; regulatory mechanisms; private versus public interests
- *Globalization*: call for global perspective; national competitiveness within a global economy; opposite: splendid isolation

This typology was used in a large-scale study of biotechnology related coverage in the *New York Times* and *Newsweek* over a period of nearly two decades.³²⁴ This was adapted from a typology used in an earlier study of print coverage of biotechnology across 10 EU countries.³²⁵

5.19 We can conclude that media representations of biotechnology and associated issues may inform and influence (as well as reflect) public perceptions of biotechnology, although the mechanisms and effects are complex. Media presentations of biotechnologies are, however, susceptible to deliberate, strategic control as well as inadvertent cultural partiality, and sectional interests can exert a significant influence on how the media frames the issues associated with them. Industry, political and scientific elites appear to be particularly responsible for this, as well as other interest groups, including civil society groups opposed to biotechnologies (although these latter are less successful in North America than Europe). The media are nevertheless an important part of a system that can create shared understandings and enable participation in the public sphere.

Rationales for public engagement

5.20 We can see that discourse in the public sphere is subject to partial framings and the attentions of sectional interests. Can public engagement create the conditions for an encounter between these framings that might produce a public basis on which to construct and evaluate policy and governance decisions more systematically, robustly and legitimately?

5.21 Before we begin to consider the uses and limitations of different approaches to public engagement in different circumstances it is necessary to be clear about why we are interested in public engagement as a possible mode of operation of public discourse ethics. Amid the complexities of different approaches and methods of public engagement, it is easily forgotten that the term is often used, quite legitimately, to refer to activities undertaken for radically different reasons.

5.22 The political stakes around public engagement compound the difficulty of balanced discussion of these general underlying issues. For example, a range of commentaries have asserted that the 2001 UK GM Dialogue process was problematic. This might seem to imply that the design or implementation was deficient in some particular fashion. Yet the underlying reasons for many

Brossard D and Kroepsch A (2003) Framing science: the stem cell controversy in an age of press/politics *The International Journal of Press/Politics* 8: 36-70).

³²⁴ Nisbet MC and Lewenstein BV (2002) Biotechnology and the American media: the policy process and the elite press, 1970 to 1999 *Science Communication* 23: 359-91.

³²⁵ Durant J, Bauer MW and Gaskell G (1998) *Biotechnology in the public sphere: a European sourcebook* (London: Science Museum).

of these concerns were actually contradictory. Some felt the process was deficient because the outcome failed sufficiently to support a policy that was of unquestionable merit. Others were concerned about lack of uptake of engagement outcomes in actual policy making. Some questioned the representativeness of the process; others the folly of striving for representativeness. The resource and time constraints were also criticised by some as a lack of commitment to the process and an attempt to diminish its influence. Engagement exercises may in fact be unwittingly 'designed to fail' if they are circumscribed in their conception for fear of contradicting a preferred outcome.³²⁶

- 5.23 As a result of these kinds of difficulty, debates over public engagement can easily become polarised around simplistic 'pro' or 'anti' caricatures. We should therefore not try to assess the advantages and disadvantages of public engagement in general, or the merits or drawbacks of different specific methods, without being clear about the particular aims.
- 5.24 A useful way to think about these issues was proposed in 1989 by the US Environmental Protection Agency official, Dan Fiorino. This framework distinguishes different reasons for public engagement according to whether they are normative, instrumental or substantive, and has been adopted in a number of influential policy reports on the challenges of public engagement in relation to the governance of innovation, notably the 1996 US National Research Council report *Understanding risk*.³²⁷
- 5.25 A **normative** rationale for public engagement is that it is a self-evidently positive process, simply because it is the *right thing to do* in a democratic society. Despite the many different conceptualisations of what a democracy is, or should be, notions of political equality and popular sovereignty are generally treated as axiomatic.³²⁸ From a normative perspective the question of whether public participation is important is turned on its head to become: 'why should we *not* involve public perspectives in societal decision making?' Evaluation of public engagement under a normative perspective will focus on various qualities of the process itself (like inclusiveness, legitimacy, representativeness, accessibility, transparency and freedom of expression) that affect the ways in which public understandings, interests and values are addressed. A crucial point is that this view focuses only on the effective practice of participatory deliberation as a process, irrespective of the outcomes.³²⁹
- 5.26 An **instrumental** rationale, on the other hand, focuses directly on outcomes. Here, the use of participatory deliberation in public engagement is seen not as an end in itself, but as a means to some pre-defined end. It is a way to *get the right answer*. Of course, the particular ends in

³²⁶ One key criterion referred to in the official evaluation of the GM dialogue process was the need for public engagement to yield outcomes that are usable in policy. If 'not usable' means not supporting the policy direction favoured by the sponsors, which is therefore of no use to them, the exercise may be assessed as deficient on those grounds. For more on this topic, and instances of contenting criticisms of the 'GM dialogue' process, see: Defra (2004) *The GM public debate: lessons learned from the process*, available at: <http://webarchive.nationalarchives.gov.uk/20081023141438/http://www.defra.gov.uk/environment/gm/crops/debate/pdf/gmdebate-lessons.pdf>; Defra (2004) *The GM dialogue: Government response*, available at: <http://webarchive.nationalarchives.gov.uk/20081023141438/http://www.defra.gov.uk/environment/gm/crops/debate/pdf/gmdialogue-response.pdf>; Horlick-Jones T, Walls J, Rowe, G, Pidgeon N, Poortinga W and O'Riordan T (2004) *A deliberative future? An independent evaluation of the GM Nation? Public debate about the possible commercialisation of transgenic crops in Britain, 2003*. (Norwich: University of East Anglia); Mayer S (2003) *GM Nation? Engaging people in real debate?*, available at: <http://www.genewatch.org/uploads/f03c6d66a9b354535738483c1c3d49e4/GMNationReport2.pdf>; Wilsdon J and Willis R (2004) *See-through science: why public engagement needs to move upstream*, available at: <http://www.demos.co.uk/files/Seethroughsciencefinal.pdf?1240939425>; Food Ethics Council (2004) *Just knowledge? governing research on food and farming*, available at: <http://www.relu.ac.uk/links/justknowledgebrief.pdf>; Wynne B (2007) Public participation in science and technology: performing and obscuring a political–conceptual category mistake *East Asian Science, Technology and Society: an International Journal* 1: 99–110.

³²⁷ See: Stern PC and Fineberg HV (Editors) (1996) *Understanding risk: informing decisions in a democratic society* (Washington, DC: National Academy Press).

³²⁸ Dewey J (1927) *The public and its problems* (Athens, Ohio: Ohio University Press, 1989); Habermas J (1996) *Between facts and norms: contributions to a discourse theory of law and democracy* (London: Polity Press); Warren ME (2001) *Democracy and association* (Princeton, New Jersey: Princeton University Press). Obviously democracy in an ancient Greek city state is different from democracy in a modern kibbutz, not least in terms of who gets to participate.

³²⁹ The term 'deliberation' has a specific (though no less contested) meaning in political theory. In this chapter, however, we use it in a looser manner to mean purposeful and open consideration, articulated in a public arena, of an issue of ethical or political significance.

question will differ from case to case. Sometimes participation may be seen as a means to foster greater ‘trust’, ‘credibility’ or ‘legitimation’ for particular institutions or technologies. At other times, instrumental objectives may highlight outcomes like ‘public understanding’ (according to a particular framing of an issue) or ‘public acceptance’ of a particular technology. Instrumentalism can, of course, just as much characterise organised participation to close off institutionally favoured choices. An instrumental perspective is apparent in an evaluative criterion that public engagement should yield results that are useful to policy makers.³³⁰

- 5.27 Finally, a **substantive** rationale for public engagement focuses on issues relating to ‘public good’, of the kind that concern us here. Like the instrumental view this concerns the outcomes of public engagement, rather than the process. But unlike an instrumental view, the outcomes in question are not favoured in relation to (often implicit) sectional interests. Under a substantive view, what counts as a positive outcome is determined according to explicit publicly-deliberated values. Of course, each of these values may be understood in different ways by different actors, but they nevertheless transcend sectional interests and understandings attached to particular positions, institutions or technologies. It is in transcending these interests through dialogue in this way that participants create a public frame in which social decisions may be ethically posed. In short, under a substantive view, public engagement offers a way to *make better decisions*.³³¹

Purposes and values of public engagement

- 5.28 If a reason for carrying out public engagement is in order to make better decisions, we ought to be able to answer the following question: why should involving public perspectives in decisions about emerging biotechnologies lead to better decisions?
- 5.29 Firstly, for interdisciplinary problems of the kind we are interested in, no single individual (or community) is likely to have sufficient expertise in all the dimensions that are likely to be important. To take an example, if a decision needed to be made about whether synthetic biology could provide appropriate responses to problems of food security, not just molecular biology would have to be taken into consideration, but also questions about agronomy and economics, among other things. Indeed, the specialist knowledge implicated in such decisions typically go beyond even the entirety of organised academic disciplines, also involving – as they often do – the experience, insight and expertise of subsistence farmers, local communities, small businesses, and food consumers.
- 5.30 This argues for a broadening, perhaps a *radical* broadening, of the range of expertise informing decisions. But the broadening of the scope of relevant interests leads to increasing difficulty in maintaining the distinction between expert and non-expert. This is not a matter of diluting or negating disciplinary perspectives, or imagining that public engagement may somehow provide a neutral way of arbitrating among them, it is rather that the radical broadening of admitted interests turns the discursive space into a public space. It is therefore, by definition, not possible for any particular specialism to claim definitive expertise. Like other exercises in the balancing of contending positions; this is a matter for political judgment.³³²
- 5.31 Secondly, for questions with significant social and economic implications, the scientific experts on whom policy makers most typically rely are unlikely to possess the full range of appropriate expertise.³³³ Even with respect to the social implications of a specialised and highly technical

³³⁰ See paragraph 5.7ff.

³³¹ It is evident from any reflection on actual public engagement exercises that they often mix these three rationales, implicitly or explicitly. Thus they may be try to foster public trust while at the same time trying to improve the quality of decision making by engaging those who stand to be affected by the decision.

³³² See paragraphs 5.1 and 5.29. Of course, some disciplinary criteria may be agreed to be more relevant to a given decision than others and they should rightly be given more prominence – the point is that they should be agreed to be so, rather than being imposed as such.

³³³ Arie Rip engagingly talks about the “folk theories” of scientists – scientists speculating about the social dimensions of their policy advice by guessing what the public thinks on the basis of their limited acquaintances, what they read in

topic, competence is multidimensional, comprising aspects of both fact and value. However, the two are not readily separable. Appreciation of scientific findings, for instance, rests on notions of proof that are dependent on background assumptions. Once again, this argues for a broadening of the range of expertise, for example to include social scientists and others who can reflect upon science as a *social practice*. One example is the way in which scientific conventions operate concerning significance and the balance to strike between avoidance of errors of Type I (wrongly concluding a false hypothesis is true) and Type II (wrongly concluding a true hypothesis is false).³³⁴ In a research context, this may involve simply trading off the speed of development of knowledge against confidence in the robustness of that knowledge. However, when science moves into policy domains, a broader range of potential consequences begin to hinge on such judgments.³³⁵ Instead of trading off 'robust but slow' against 'unreliable but fast' developments of knowledge, the importance of vulnerability to Type II error under these circumstances involves the balance of interests of those benefitting from the rapid knowledge gains against the interests of those who stand to be harmed. This becomes rather important where the issue involves judgments between different courses that each involve significant uncertainties, for example the need to develop a vaccine rapidly in response to a possible pandemic or the possible deployment of a weaponised pathogen.³³⁶

Modes and methods of public engagement

- 5.32 These arguments support a form of public engagement that is aimed at framing decisions of policy and governance relating to emerging biotechnologies in a way that is orientated by a notion of public good. However, the way in which this is carried out in practice can achieve this outcome with variable degrees of success. Some experiences may even be counterproductive, as some evaluations suggest,³³⁷ insofar as their operational failures may lead not to a public discourse on policy and governance, but instead to retrenchment on all sides. Before any deliberate substantive engagement around a particular issue takes place, there therefore needs to be a prior accord about the aims and the methods of the engagement, and also about how it will be evaluated. A different way of framing this is to recognise that the engagement itself needs to be orientated towards the public good and constructed so as to be able to deliver this within the constraints of the context (for example, given the range of participants, the nature of the knowledge they bring and their interests).
- 5.33 Even within shared perspectives there is often a lack of consensus about what is effective public engagement in particular circumstances. In deploying the catch-all term public engagement it is therefore possible to fail to acknowledge the diversity of practical approaches and the objectives these activities seek to achieve. In order to keep this diversity in mind it will be helpful to describe briefly the primary dimensions of variation between different approaches.³³⁸
- 5.34 Perhaps the most obvious distinction that can be made among public engagement activities is in relation to the direction and nature of communication between researchers and members of the public. In what might be termed conventional science communication activities, such as

the newspapers and the conventional wisdom of their class. Rip A (2006) Folk theories of nanotechnologists *Science as Culture* 15: 349-65.

³³⁴ For more information on the concept of Type I and Type II errors, see: Stanford Encyclopedia of Philosophy (11 August 2011) *Risk*, available at: <http://plato.stanford.edu/entries/risk>.

³³⁵ The lessons of experiences like those with tobacco, asbestos, lead, benzene, mercury, PCBs, dioxins, acid rain, CFCs and ionising radiation – to name only a few – show that early emphasis on avoidance of Type I errors (wrongly presuming harm) can lead to what, in retrospect, are seen as serious forms of Type II error (wrongly presuming safety). See: European Environment Agency (2001) *Late lessons from early warnings: the precautionary principle 1896-2000*, available at: http://www.eea.europa.eu/publications/environmental_issue_report_2001_22.

³³⁶ See paragraph 3.9, Box 3.1 and paragraph 8.23.

³³⁷ Sheufele DA and Ross JE (2011) *Modern citizenship or policy dead end? Evaluating the need for public participation in science policy making, and why public meetings may not be the answer*, available at: http://shorensteincenter.org/wp-content/uploads/2012/03/r34_scheufele.pdf.

³³⁸ There are several studies in the literature that attempt to map out a typology of public engagement practices. See, for example, Rowe G and Frewer LJ (2005) A typology of public engagement mechanisms *Science, Technology & Human Values* 30: 251-90. For a further discussion, see: Chilvers J (2010) *Sustainable participation? Mapping out and reflecting on the field of public dialogue on science and technology*, available at: <http://www.sciencewise-erc.org.uk/cms/assets/Uploads/Strategic-Research-documents/Sustainable-Participation-report-03-10.pdf>.

information campaigns, exhibitions, open-labs, social surveys, or forms of opinion research, communication can be characterised essentially as flowing in a single direction, from scientists to the public, or vice versa. These activities are important and may provide resources and stimulus for a public that is more engaged with questions on biotechnology policy and governance.

- 5.35 These one-way communications can be distinguished from activities that seek to achieve genuinely two-way dialogue and deliberation between the participants, of a kind that may inform decision making.³³⁹ For an activity to constitute public engagement in this second sense, it should entail more than the presentation of 'facts' about science and technology, or the transmission of existing opinions or preferences held by some specific element of the public at a particular point in time. Rather, it should involve an exchange of views between researchers,³⁴⁰ publics and other social actors, with the potential for each to inform the other's understanding of the issues at hand. This is not to imply that activities of the first kind are intrinsically negative, but rather that they constitute an *entirely different* set of procedures with different aims and objectives.
- 5.36 Within the broad range of activities that constitute public engagement in the second, deliberative sense, distinctions can be drawn according to the extent to which their purpose is to arrive at a consensus or recommendation for action. Some approaches, such as citizen's juries or consensus conferences specify coming to a collective decision as an explicit objective, while others, such as deliberative mapping aim primarily to make apparent the diversity of relevant perspectives.³⁴¹ The distinction is important because although consensus may be a desirable result of public engagement from a policy maker's perspective, setting this as an objective (or even as an evaluation criterion) may result in convergence to a 'lowest common denominator' position, or domination by narrow or sectional majorities.³⁴² Even for policy makers who think they want this, the volatile nature of engineered consensus can, in any case, make it a hazardous political commodity.
- 5.37 Approaches to public engagement also differ in the ways in which they define the population of interest and assemble participants. While many impose some control over the mixture of characteristics among participants, this is generally implemented through quotas that are intended to match a particular selected group of participants to the wider population of interest.³⁴³ For instance, participants might be recruited so as to include specified numbers from groups defined by age, sex, ethnic group, and socio-economic status. Few approaches attempt to use random sampling strategies for reasons of both cost and practicality: not only would the use of random samples generally require a substantial financial outlay to recruit and involve, the useful approximation of a random sample to composition of the population from which it is drawn only begins to hold in samples that are arguably too large to enable effective deliberation.³⁴⁴

³³⁹ Rowe G and Frewer LJ (2005) A typology of public engagement mechanisms *Science, Technology & Human Values* **30**: 251-90.

³⁴⁰ In a dialogue model, the public may be able to call on 'experts' to provide specialist information in relation to particular disciplines. In this situation researchers' roles may involve facilitation, enabling participants to gather the information that they – the participants – determine they need in order to address the issues around which they have convened.

³⁴¹ Burgess J, Stirling A, Clark J *et al.* (2007) Deliberative mapping: a novel analytic-deliberative methodology to support contested science-policy decisions *Public Understanding of Science* **16**: 299-322.

³⁴² For this point, see generally: Stirling A (2008) "Opening up" and "closing down": power, participation, and pluralism in the social appraisal of technology *Science, Technology & Human Values* **33**: 262-94.

³⁴³ Ordinarily, this would be done according to known or hypothesised population parameters, in accordance with a methodology chosen as appropriately according to the aims of the exercise, implying yet another level of framing to attend to; see paragraphs 5.50 to 5.51.

³⁴⁴ A notable exception is the 'deliberative polling' methodology of James Fishkin and colleagues, although this approach is subject to high levels of differential non-response and other methodological weaknesses. For a discussion of deliberative polling methodology, see: Fishkin JS (1996) The televised deliberative poll: an experiment in democracy *The Annals of the American Academy of Political and Social Science* **546**: 132-40; for a discussion of methodological weaknesses, see: Merkle DM (1996) The polls - review: the national issues convention deliberative poll *Public Opinion Quarterly* **60**: 588-619.

Dilemmas of public engagement

- 5.38 From our discussion we can see how including public engagement in the development of policy and governance for emerging biotechnologies raises a set of overlapping and interacting dilemmas. Many of these can be traced back to ambiguity about the underlying aims. They give rise to questions about the appropriate approach to public engagement but also more fundamental questions about the influence of public engagement in aligning biotechnology policy with the public good. If the ways in which people are selected, invited, incentivised and directed to inform and participate in biotechnology decision making have a significant effect on subsequent technological trajectories, it must be important to be both transparent and critical about how such procedures are chosen and implemented.
- 5.39 We therefore conclude that the selection of procedures for public engagement should involve consideration of the likely consequences of favoured approaches relative to alternatives. There is therefore no single 'best' method of public engagement, and the choice of approaches will always involve dilemmas. If the approaches used are poorly aligned with underlying objectives, the result may be poorer, rather than better, quality outcomes.³⁴⁵ However, it is also important to recognise that the identification of dilemmas and difficulties in the practical implementation of public engagement should not be taken as a rejection of the underlying rationale, whether that is normative, instrumental or substantive.

'Upstream' engagement

- 5.40 If engagement is seen as a means to explore claims about the balance of negative and positive consequences of particular innovation trajectories at an early stage,³⁴⁶ then the kind of dilemma (the Collingridge dilemma) that we discuss in Chapter 1 arises.³⁴⁷ In other words, how can decisions that strongly determine the future be made in conditions of uncertainty, where so much relevant information is lacking? In particular, what weight can be placed on the opinions of non-specialists, for whom even speculative possibilities are remote?
- 5.41 So-called upstream engagement that takes place when the concrete implications of research are distant and unclear may therefore focus less on the speculative implications of research and instead on the rationales for allocating resources to different social priorities, priorities to which different biotechnologies (or alternative measures) might offer a possible response. In this case, the challenges for upstream engagement become less to do with confronting substantive uncertainties in knowledge and more to do with determining the appropriate scope of the different values and interests to be included.³⁴⁸
- 5.42 The difficulty here is about how to make these contrasting aims and interests more visible and accountable, when the interests of those involved in particular research and innovation systems may want to narrow rather than open up the scope of alternatives. There is also the practical difficulty of identifying and, if appropriate, including potentially affected parties in the deliberative process. When the social and economic consequences of decision-making are supra-national, as is often the case in the context of emerging biotechnology, the challenge to make deliberative participation inclusive is formidable. For example, national engagement activities might yield preferences such as to invest in a certain technology to increase gross domestic product because this is deemed to be in the national interest, while a very different outcome might prevail were the activity to include potentially affected parties from the developing world.

³⁴⁵ Dietz T and Stern PC (Editors) (2008) *Public participation in environmental assessment and decision making* (Washington, DC: National Academies Press).

³⁴⁶ 'Upstream' unhelpfully evokes a sequential innovation system, which is not necessarily the case with biotechnologies, although it may be more typical of the highly managed development of new products, for example in drug development.

³⁴⁷ See paragraphs 1.27 to 1.29 and Box 1.2.

³⁴⁸ Wynne B (2007) Public participation in science and technology: performing and obscuring a political–conceptual category mistake *East Asian Science, Technology and Society: an International Journal* 1: 99–110.

The imperatives of deliberation and decisiveness

- 5.43 Public engagement can offer a means to form consensus around concrete justifications for particular decisions. Consensus conferences and citizens' juries have aims of this sort. The strength and legitimacy of any such consensus or verdict must depend, however, on the extent to which the process can be shown to conform to democratic and deliberative principles. This, in turn, foregrounds questions about representativeness, for example: on what grounds can a small, possibly self-selected group, no matter what quality of deliberation it may achieve, be claimed to represent (or to be representative of) wider society?
- 5.44 If, conversely, public engagement is seen as a way of 'opening up' broader appreciation of the pros and cons of possible innovation pathways seen under different perspectives, then the representativeness difficulty is diminished. Seen with this aim in mind, the purpose is not (instrumentally) to justify a single settled verdict but, instead, to inform wider (substantive) policy debates. Rather than bringing such debates to a close it opens them up further by introducing ways in which different social values and interests may support alternative innovation trajectories.³⁴⁹
- 5.45 The dilemma, then, is that by opening up broader perspectives and values rather than reaching substantive consensus, public engagement denies decision makers the instrumentally useful justification for particular decisions. At the same time, it reveals the extent to which established political processes need to secure legitimacy for what will likely remain quite controversial decisions.
- 5.46 As it would be improper to shift the burden of decision-making from properly authorised and accountable decision makers to other groups such as advisors or consultees, **expert deliberation and public engagement exercises should report their conclusions not in the form of simple prescriptive findings but as properly qualified 'plural and conditional' advice.** A wide range of policy options may thereby still be ruled out as being inferior under any reasonable perspective. But in this case, these options can be seen to be ruled out for well-examined reasons rather than as a matter of expediency in order to arrive at a definitive conclusion. This is particularly appropriate where adjudication between alternative rationales involves inherently political matters concerning the prioritisation of contending interests or values. It is through encouraging more explicit, rigorous and accountable wider political debate that plural and conditional policy advice might help to enable more democratic social choice among and between emerging biotechnologies and their alternatives.

The imperatives of freedom of deliberation and policy relevance

- 5.47 A third kind of dilemma concerns another feature of the relationship between public engagement and decision making procedures around emerging biotechnologies. This is the expectation, which is prominent in many evaluation exercises, that public engagement will generate outcomes that are relevant or usable in policy making.
- 5.48 Seen under an instrumental perspective, where public engagement is regarded as a means to help construct crucial qualities of legitimacy, credibility and trust (even acceptance) for particular decisions, this is an essential feature for engagement to have any practical value. Such practical value is, furthermore, the justification for the often considerable allocations of time and resources involved, and without it public engagement can seem a distracting and expensive irrelevance.
- 5.49 The dilemma is that 'usefulness' or 'relevance' must be construed in terms of the degree to which engagement furthers a pre-determined aim; however, to frame engagement in this way

³⁴⁹ Stirling A (2008) "Opening up" and "closing down": power, participation, and pluralism in the social appraisal of technology *Science, Technology & Human Values* 33: 262-94.

prevents it from being a public (in the sense of non-partial) engagement. It is a consequence of our argument in Chapter 4 that the criteria of relevance should therefore not be narrowed to the extent that outcomes of public engagement are relevant only if they answer policy makers' questions, but instead broadened to value the extent to which they address questions of public good.³⁵⁰

Representativeness

- 5.50 A frequently made objection to public engagement on the deliberative model is that the few participants who *are* involved cannot stand in for the many who are not, but who may have an equal or greater interest in the outcome. Striving for representativeness is, in many cases, inspired by the attempt to escape from partiality, enacting the virtue of equity that we identified in Chapter 4.³⁵¹ As we noted above, however, given the uncertainties and the ambiguities of emerging biotechnologies (where engagement is itself a process of exploring these features), it may be impossible to identify at the end of the process, let alone at the beginning, the scope of relevant interests and therefore what would constitute a representative group. There may, in fact, be so many dimensions of interest, and these interests may cut across individuals,³⁵² that the attempt to produce a balanced representative sample leads to indefinite or unmanageable expansion. Conversely, given the range of other interests and concerns that any individual member of society may have, there must be a limit to their willingness and capacity to engage with all questions that potentially affect even themselves and their families.
- 5.51 This does not mean that engagement with few, perhaps unrepresentative, perhaps self-selecting individuals has no positive value from the point of view of public ethics, as part of the ecosystem of engagement. In the case of nanotechnology, for example, a few thousand members of the UK public have been involved in deliberative processes.³⁵³ Why, it is asked, should such a comparatively small number be afforded particular attention compared to the 60 million or so who have not been reached? An important perspective on this is that in these events, between 50 and 100 scientists or policy makers have been directly involved in public dialogue, which is quite a significant fraction of the major professional actors involved, many of whom, as a result, will perhaps think differently about the value of different perspectives than they might otherwise have done. This is, potentially, a positive end in itself. However, it is clear that it also leaves open the possibility of scientists and policy-makers merely *appearing* to have taken public perspectives into account; if practice remains unaffected by interaction with the public, the cloak of legitimacy lent by the engagement process may be considered a worse outcome than had no public engagement taken place at all.

Informing and eliciting

- 5.52 The role of the public in science governance and decision making has moved on considerably from the days in which it was dominated by the 'knowledge deficit model', in which the purpose was seen as being to inform a largely ignorant and sceptical public about the 'facts' of science and technology.³⁵⁴ Nonetheless, questions remain about the ability of non-specialists to acquire a sufficient grasp of complex areas of science to enable them to make meaningful and well-founded contributions to technology choice.³⁵⁵ This applies equally to the ways in which different people conceptualise probability, risk and the appraisal of conflicting evidence as it does to any particular field of technical knowledge.

³⁵⁰ See paragraph 4.49.

³⁵¹ See paragraph 4.29.

³⁵² As we noted in paragraphs 3.28 4.37 and 5.1, this makes their own positions ambiguous, i.e. where one individual 'represents' more than one perspective or set of interests which each must reconcile individually.

³⁵³ See: Gavelin K, Wilson R and Doubleday R (2007) *Democratic technologies? The final report of the Nanotechnology Engagement Group (NEG)*, available at: <http://www.involve.org.uk/wp-content/uploads/2011/03/Democratic-Technologies.pdf>.

³⁵⁴ Irwin A and Wynne B (2004) Introduction, in *Misunderstanding science? The public reconstruction of science and technology*, Irwin A, and Wynne B (Editors) (Cambridge: Cambridge University Press).

³⁵⁵ Collins H and Evans R (2007) *Rethinking expertise* (Chicago, Illinois: University of Chicago Press).

- 5.53 The dilemma of technical competence is entwined with the issue of representativeness, insofar as some members of the public will find the technical aspects of science easier to grasp than others. It is possible for the procedures of public engagement to address absences of technical competence, for example, by involving expert informants, although such approaches have built-in limitations. There is, for example, only so much that can be achieved within time and resource constraints, and the reliance on technical expertise raises further questions about how it is selected. On the other hand, the inevitably differing competencies that participants bring to engagement activities makes it possible that the influence of existing socio-economic inequalities may be exacerbated rather than ameliorated.
- 5.54 The notion that public engagement should be used as a way of securing public consent for decisions made by experts is regarded with disdain by most advocates of public engagement, even though it still exists in scientific and policy discourse.³⁵⁶ Nevertheless, the ideal separation between the processes of eliciting public perspectives and of conditioning them is not always possible to sustain in practice. Scientists who have sincerely and strongly held views about the desirability of a particular course of action, which they will seek to reinforce with scientific arguments, will often, in good faith, seek to persuade others to accept their points of view.³⁵⁷ That is not to say that we would never support the right – and indeed the desirability – of scientists taking overtly political positions, so long as they are represented and understood as such. The problem is not with the scientists and, for the same reason, not with the lack of specialist technical competence among the lay majority, but with framing the debate in a way that privileges scientific argument where the decision is more than a technical one, and where the technical judgment and moral judgment of scientists become confused.

‘Top-down’ and ‘bottom-up’ engagement

- 5.55 We can distinguish between public engagement that is instigated through formal institutional channels where members of the public are invited (or recruited) to participate, and engagement that occurs in spontaneous, uninvited ways, instigated through interest groups, voluntary organisations or members of the public.³⁵⁸ Whatever direction from which the initiative comes, what categorises these initiatives as engagement is the attempt, as we have noted at paragraph 5.30, to construct a public space within which to represent the issues. Nevertheless, depending on the issue and context, the origin of the initiative may have a bearing on how effectively this proceeds and the commitment that different parties have to it.
- 5.56 Top-down approaches are potentially problematic in that those initiating the engagement often have vested interests and instrumental reasons for doing so. On the other hand, bottom-up engagement is by nature spontaneous and responsive rather than anticipatory.
- 5.57 The difficulty is that, by the time a technology becomes an appropriate subject for a possible policy decision – the point at which broader engagement usually takes place – it has already emerged to a significant degree and the issues are already invested with values and expectations. An important response to this, as we have suggested in Chapter 4, is to do with cultivating an environment in which engagement is not exceptional but enabled, in which there are healthily diverse ecosystems of engagement.

³⁵⁶ See, for example, Leask J, Braunack-Mayer A and Kerridge I (2011) Consent and public engagement in an era of expanded childhood immunisation *Journal of Paediatrics and Child Health* 47: 603-7.

³⁵⁷ For a discussion of scientists engaging in ‘issues advocacy’, whereby eliding scientific arguments and political positions ‘stealth issues advocates’ attempt to attach the authority of the former to the latter, see: Pielke RA (2007) *The honest broker: making sense of science in policy and politics* (Cambridge: Cambridge University Press).

³⁵⁸ Wynne B (2007) Public participation in science and technology: performing and obscuring a political-conceptual category mistake *East Asian Science, Technology and Society: an International Journal* 1: 99-110.

Governance by visible and invisible hands

- 5.58 If it is accepted that social and political decisions about biotechnologies should not be reserved to a private cadre of experts but should be opened up to public influence, a powerful objection to the whole notion of public engagement in technology decisions becomes that the job of selecting the most desirable innovations can be left to the free market, as the most effective means of aggregating the preferences of many different actors.³⁵⁹
- 5.59 A general problem with this is that any specific real-world market is fundamentally shaped and structured by its social context. Contingent power relations, distributions of resources, cultural sensibilities, institutional structures and incumbent interests – as well as socially-conditioned preferences – may well yield contrasting (but equally market based) technological preferences. In a complex, dynamic and path-dependent world, the contingent ways in which these factors have evolved historically may not present the best basis for prospective long term social choices. Conversely, as we have noted at paragraph 3.25, potentially transformative technology choices present opportunities to change these very conditions in the future. In this sense, then, markets present many of the same kinds of contingencies and challenges as a form of aggregation as does finding an ideal mode of public engagement. Although not irrelevant, markets present no more definitive a means to resolve questions of social choice, than do carefully-designed deliberative procedures. In short, neither is definitive or unconditional, but one may have a potentially important balancing effect on the other.
- 5.60 More specifically, although notions of preference may be useful to address the relatively straightforward process of choosing between pre-defined alternatives, governance of emerging biotechnologies is as much about the forming of alternatives as choosing between them. Furthermore, given the manifest changeability of social preferences, important questions concern where these come from and how they are conditioned. The market offers a very poor way to appreciate the multidimensional values and understandings that constitute the formation of preference and the basis of the choices made.

Biotechnological exceptionalism or the need for public engagement?

- 5.61 In the previous Chapter we referred to the general argument that where public money is spent on biotechnology research and development, the public should have a direct say in how it is spent.³⁶⁰ One possible response to this is that anyone who asserts this view must explain *why* this spending should be any different from the many other places in which the Government spends money without direct public input, governed by the overall framework of representative democracy. Of course, such a response ignores increasingly prominent arguments concerning the general imperative towards greater public deliberation across all areas of policy making. The more opaque and technocratic the field of policy, and the more neglected in prevailing political discourse, one might say, the more force this argument has. Nevertheless, the question raises some important issues for a report of the present kind.
- 5.62 A more specific argument for effective public engagement in the field of biotechnology follows on from the commonly asserted claim that research should be carried out in pursuit of “widely shared societal goals”.³⁶¹ To the extent that notions of public good are, implicitly or explicitly, important in debates over emerging biotechnology, the relevance of public deliberation is as clear here as elsewhere. Indeed, similar pressures for greater public engagement are arguably often as evident in other areas of public life as they are in biotechnology, especially where

³⁵⁹ This assertion is associated with free-market economist and philosopher Friedrich Hayek (Hayek FA (1944) *The road to serfdom* (Chicago, Illinois: University of Chicago Press, 2007)). Such an approach has been strongly and relevantly criticised, most recently by the political philosopher Michael Sandel (see: Sandel M (2012) *What money can't buy: the moral limits of markets* (London: Allen Lane)).

³⁶⁰ See paragraph 4.9.

³⁶¹ Jones R (2011) Some questions for British research policy, on *Soft Machines* [internet blog] 22 July, available at: <http://www.softmachines.org/wordpress/?p=1075>.

questions are raised about responsiveness or accountability (e.g. criminal justice, health care and local government).

- 5.63 However, in the case of biotechnologies, how the societal goals are identified and prioritised is especially salient since it is increasingly the case in the UK³⁶² that science and technology are steered by freestanding agencies that are deliberately set apart from government, such as the research councils, established by Royal Charters and operating under a particular understanding of the Haldane principle.³⁶³ Institutionally, these bodies are set up to be more remote from the normal routes of parliamentary accountability than many other agencies and activities of government. The policy of such bodies (as we will discuss in Chapters 6 and 7) is nevertheless already much more strongly influenced by scientific experts and by industry voices than by the political process, so these arguably rather sectional points of view may need to be balanced by countervailing voices drawn from a wider section of society. In this sense their discursive space contrasts with public discourse, being both private and partial (according to our definition of these concepts in Chapter 4).³⁶⁴
- 5.64 A final, very important issue surrounds the distinctive ways in which questions of science and technology tend to be discussed in Parliament and other policy arenas. With regard to science in policy around emerging biotechnologies, the repeated emphasis remains on 'sound science'.³⁶⁵ Attention typically fails to differentiate the ways in which policy can never, and should never, be solely based on science. Science of itself, in practice, rarely determines only a single possible interpretation or action. With regard to policy for science there is a similarly simplistic and unhelpful tendency to frame debates around 'pro- and anti-' dichotomies in relation to technology or innovation in general. This means that policy debates typically fail to consider the potentiality of social choice among alternative emerging biotechnology trajectories, let alone engaging with the practical details.
- 5.65 It is telling to compare this ubiquitous 'pro' and 'anti' language that is found in relation to technologies with the absence of what would be the comparable 'pro' and 'anti' language in areas like welfare, education or foreign policy. This same lack of differentiation is indicated by another issue we explore:³⁶⁶ the lack of discrimination (despite the abundance of data) in the statistical information that is collected about research and development such as would make possible a clear public understanding of the choices that are actually being made, let alone the alternatives that might be chosen. In other words, public engagement is especially relevant in the field of emerging biotechnology, because it is precisely in this area that the normal democratic political process is most at risk of being undermined by deference to partial technical discourses and 'science based' policy that may obscure the realities of social choice between alternative scientific and technological pathways.

³⁶² See paragraph 7.10.

³⁶³ See paragraph 7.50ff.

³⁶⁴ See the Chapter 4 overview and paragraph 4.42.

³⁶⁵ See, for example, House of Commons Hansard (17 November 2000) c1209, available at: <http://www.publications.parliament.uk/pa/cm/199900/cmhansrd/vo001117/debtext/01117-10.htm>; House of Commons Hansard (5 December 2011) *Draft Renewable Transport Fuel Obligations (Amendment) Order 2011*, available at: <http://www.publications.parliament.uk/pa/cm/cmtoday/cmstand/output/deleg/dg01111205-01.htm>.

³⁶⁶ See Chapter 7, below. This issue was the subject of a recommendation from a recent House of Lords Select Committee. See: House of Lords Science and Technology Committee (2010) *Setting priorities for publicly funded research – volume I: report*, available at: <http://www.publications.parliament.uk/pa/ld200910/ldselect/ldsctech/104/104i.pdf>, paragraph 67. See also evidence given by Professor Andrew Stirling in House of Lords Science and Technology Committee (2010) *Setting priorities for publicly funded research – volume II: evidence*, available at: <http://www.publications.parliament.uk/pa/ld200910/ldselect/ldsctech/104/104ii.pdf>, pp283-88. The Government's response to this recommendation, while noting problems in consistency in reporting, mainly highlights the relative abundance of data in this area, rather than acknowledging the difficulty of making practical use of those data for the important ends identified (e.g. to understand rationales behind resource allocation, departmental accountability and maintenance of national capacity). For the Government response, see Department of Business, Innovation and Skills (2010) *Government response to the House of Lords Science & Technology Select Committee report "Setting priorities for publicly funded research"*, available at: <http://www.bis.gov.uk/assets/biscore/science/docs/g/10-1090-government-response-priorities-publicly-funded-research>, p2.

Conclusion

- 5.66 In this Chapter we have considered issues related to the use of organised public engagement initiatives to inform biotechnology policy and governance. We found that the term ‘the public’ does not refer to a stable, homogeneous and definable group, but is characterised by distinction from those with recognised expertise or authority relevant to decisions about biotechnology policy and governance. Our earlier conclusion (Chapter 4) that emerging biotechnologies are a matter for public ethics,³⁶⁷ and that public ethics is constituted by a discursive practice, orientated by the notion of public good, effaces the distinction between expert and public. ‘Public perspectives’ in the sense in which we have discussed them, are those of a range of social actors, all of whom may contribute to framing biotechnology choice in terms of public good. Public engagement activities therefore, in principle, provide an operational methodology for framing biotechnology policy and governance in terms of public ethics.
- 5.67 However, we observe that the terms on which engagement exercises are undertaken and the way in which they are incorporated as part of the processes of policy development and governance may result in their effectiveness being limited or their outcomes narrowly evaluated. We conclude that there is therefore no ‘royal road’ to effective engagement. Careful and critical attention must therefore be given to the alignment of the method with the underlying rationale for engagement, and the aims and expectations of engagement should be understood in advance.
- 5.68 We observe that the utilisation of public engagement (i.e. within in a policy or governance process) gives rise to a number of dilemmas. In no case, however, can public engagement substitute the responsibility of policy makers. We therefore conclude that the outcomes of public engagement, just like expert technical advice, should be reported in a properly contextualised and conditional way rather than as simple prescriptive advice. We conclude by extending our argument in Chapter 4 concerning the distinctive public interest in biotechnologies in a way that accounts for the special relevance of public discourse to biotechnologies. Cultivating the institutional and procedural virtues identified in Chapter 4 to develop a culture or ecosystem of engagement helps to overcome the dilemmas identified in this Chapter, with public engagement forming the context – rather than being inserted into the process – of biotechnology policy and governance.

³⁶⁷ See paragraph 4.42.