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REPORT

Performance Audit Handbook

Routes to effective evaluation

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RAND EUROPE

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Preface

RAND Europe is an independent not-for-profit policy research organisation that aims to improve policy and decision-making in the public interest, through research and analysis.

RAND Europe's clients include European governments, institutions, NGOs and firms with a need for rigorous, independent, multi-disciplinary analysis. This report has been peer-reviewed in accordance with RAND's quality assurance standards.

The handbook will be of interest to those, like its authors, who are engaged in conducting performance audits and evaluation and reflecting in the effectiveness and use of performance audits. They are likely to be found not only in audit bodies but also in the various research and academic institutions that support these activities and in a wider research community that is interested in performance audit more generally. It is not intended as another contribution to social research methods (of which there are many excellent examples) but rather it aims to take these methods and make them applicable in a performance audit setting.

This handbook is intended as a first edition and we look forward to receiving feedback on both its current content and potential later additions. We will then develop future editions in this light. In this sense it is offered more in the spirit of opening a conversation within the international performance audit community than as a set of lessons for others to follow.

Acknowledgements

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We would also like to thank the UK National Audit Office and Oxford University Press for permission to use material previously published by them.

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CHAPTER 1
Introduction: the changing context of performance audit *Tom Ling*

Future, more diffused approaches to governance, in all parts of society, will only work if there are frameworks in place that assure very high levels of transparency, accountability and integrity. (OECD, 2000, p. 3)

1.1 The changing architecture of accountability

Performance audit involves drawing together evidence to support judgements about the worth and value of activities made possible by the use of public resources (money, authority, staff, etc). Unlike pure research it is driven by questions that should matter to those holding others to account: Parliamentarians and other elected officials, the public, the media, organised interest groups and so forth. It should also produce conclusions that are comprehensible to these groups and recommendations that can be put into effect. It has corollaries in the private sector, and many of the methods described here are also of use in the private sector, but performance audit, in the sense used here, is inherently linked to the idea of a sector delivering public benefits and being held to account for doing so. Its first purpose is, therefore, to strengthen accountability by making evidence available to allow citizens to understand what has been done in their name and with what consequences. Its second, equally important purpose is to facilitate reflection and learning so that future public services might be better run and public activities focused more intelligently on public benefit; and (if we are to avoid a technocracy) we strongly argue that weighing benefit should be shaped by political judgements. However, the ability of performance audit to achieve this depends crucially upon the validity and reliability of its findings and, for this reason, like pure research, only the highest standards of approach and methodology are acceptable. This is the focus of this handbook.

A central thesis here is that, in recent decades, this task of supporting and delivering performance audit has become technically more demanding. The subsequent chapters address some of these technical issues and they aim to provide a toolkit of approaches needed by the contemporary performance auditor. They draw upon many years of experience at RAND Europe delivering performance audit for a wide range of clients and in particular for the UK National Audit Office and the European Commission. However, this should come with an "auditors' health warning": improving the methodologies of performance audit will only strengthen performance audit to a certain extent. Successful performance audit also depends upon having wider clarity in society about its legitimate breadth and depth and this is a theme that will be developed in a volume by Wilkins, Ling and Lonsdale (forthcoming) to be published by Edward Elgar.

So the central theme of this introductory chapter is that the architecture of the contemporary state is changing in ways that cause problems for the role of performance audit and that at least part of the response to this must be to adopt a more sophisticated set of audit approaches and methodologies. In this

context, architecture refers to the relationships amongst the organisations involved in delivering, communicating and acting upon performance audit (audit bodies, organisations commissioned to support the work of audit bodies, parliament, government, the press, and departments and agencies), the resources they use (money, statutory powers, skills, influence) and the power relationships that hold them together.

The problematic transformations for performance audit might be organised into four dimensions. First is the problem of agency: identifying who was responsible, how decisions were made, or even the intended purpose has become increasingly difficult. Second is the problem of attribution: we may be able to measure certain outcomes, for example, but understanding what was causally necessary or sufficient for this outcome to be achieved can prove elusive. Third is the problem of measurement: many inputs, processes, outputs and outcomes can be very difficult to measure, especially where these are intangible (trust, social capital, confidence, and even happiness might be relevant but difficult things to measure). Fourth is the problem of whose benefit is being measured and the need to recognise that there may be multiple stakeholders with different and even incommensurate interests; in this case achieving an understanding of aggregate benefit could be difficult or unhelpful. Below, we consider these four dimensions in turn.

1.2 Agency in the de-bureaucratising state

Arguments about agency in the modern state are not new. They address the question "Who makes the key determining decisions?" or, at least, "In what setting and through what processes are these decisions taken?" Historically these often concerned the role of administration compared with political leadership. Weber, in particular, was concerned about "bureaucratic power becoming out of control" (Gerth and Mills, 1948, pp. 232–235). Weber's concern, however, was relatively straightforward and focused on a perceived tendency in the modern world to move decisionmaking from democratically accountable forums to the bureaucracy. Lenin is often said to have called this the "who-whom" question. As public services became more complex, however, the problem of agency increased. As long ago as the 1940s there was an active debate (the so-called Friedrich-Finer debate) over whether external controls were sufficient to ensure accountability, or whether professional and ethical motivations were also necessary (see Friedrich, 1940).

In recent decades agency has become more dispersed and the "problem of many hands" has meant that performance auditors need to interrogate not simply one decisionmaker but to understand a potentially long chain of interactions – potentially with feedback loops – which culminate in particular outcomes (see further: Ling, 2002, Pierre and Peters, 2000, Rhodes, 1997, 2000, Richards and Smith, 2002, Smith, 1999, Walsh, 1995). This can be seen as a problem of growing complexity. Public services have become more complex in at least two ways (see Stame, 2004, p. 64). First, policymakers have attempted to create integrated programmes bringing together different services such as Health, Social Care, Urban Regeneration and Employment, or integrating previously fragmented agencies working in delivering the same service (such as acute and primary health care). This is in recognition of the fact that the processes producing those services are themselves interlocked. Second, within a multi-level system of government European, national, regional and local levels of government can all be involved.

These could be called horizontal and vertical complexities.

Across contemporary states we have seen a movement towards a differentiated policy model in which there are policy networks, power dependencies and complex relationships between the centre and devolved, regional, local and mayoral authorities. The popular grumble that "no-one seems to take responsibility for their actions any more" reflects something more deeply rooted than simply the pusillanimity of decisionmakers.

Techniques outlined in later chapters capable of helping the hard-pressed performance auditor to grapple with the question of agency include logic models, network analysis and process mapping, and findings may be supplemented with interviews, focus groups, surveys and Delphis.

1.3 Attribution when government becomes governance

In contemporary states, many areas of activity are being characterised by less *government* and more *governance*. Consequently, relationships within the public sector becoming more differentiated, with partnerships between public bodies and more non-state organisations (both corporate and third sector) involved in the business of delivering public services. This involves a new set of players, including:

- private and not-for-profit bodies contracting to do work previously done by public bodies
- new collaborations within the public sector involving partnerships between agencies that were previously only weakly connected
- private bodies taking over responsibility for public services
- co-financing and pooled budget arrangements with public and private money combined to deliver a service
- partnerships with a more or less formal status
- more elusive arrangements of state and non-state bodies being encouraged to collaborate for mutual benefits and public gain.

OECD has argued that "old forms of governance, in both the public and private sectors, are becoming increasingly ineffective" and that "new forms of governance needed over the next few decades will involve a much broader range of active players" (OECD, 2000). The key features of new manifestations of governance arrangements include:

- new cross-cutting tasks and targets where agencies and departments are given shared responsibilities
- more multi-level governance arrangements involving local, regional, national and European levels of government
- in the name of greater transparency in the face of complexity, the rise of inspection and regulation in the public sector
- the (partial) empowerment of new partners in public service provision and an engagement of users of services and other stakeholders.

Metaphorically we can think of attribution in government in terms of a truck and trailer; we know where the engine of change is to be found and we can identify the driver and her intentions. With governance the metaphor is more akin to a fleet of ships loosely held together by a set of rules of the ocean, terms of engagement, shared charts, and influenced by the same winds and sandbanks. We need to understand the rules and their interpretation in each ship, the capacities of different vessels, what charts they are using, and their skills in sea-craft if we are to understand, hold

to account and learn from the movements of the fleet.

In addressing the problems of attribution, the performance auditor might draw upon the chapters on benchmarking (we cannot understand how well the fleet is working until we compare it with other examples), econometrics to understand how the fleet behaves, focus groups, interviews and surveys to understand motivations, grounded theory to make sense of what we are being told and Delphis to understand what experts believe.

1.4 Measurement in the face of multiple players, interests and timeframes

The above developments have both made measurement more difficult and fed an appetite for more measurement on the grounds that "what cannot be measured cannot be managed". More specifically for performance audit, this new terrain has important implications. We consider three of these here:

1. The involvement of statutory, voluntary, corporate and community bodies in delivering services makes it more difficult to account for and measure the use of public money and often to measure outcomes, especially because it is unclear what these bodies might have done in the absence of public money or public sector steering.
2. If it is more difficult to understand what to measure, it is also more difficult to understand when to measure. Many examples of governance have the explicit aim of securing long-term improvements or benefits in services, such as transport, education and crime reduction, which may take over 20 years to be completed. However, neither performance auditors nor the public have been willing to wait until their completion before asking audit questions. Arriving at an ex ante, audit judgement requires auditors to take a view on decisions that relate to an uncertain future (see Ling, 2003).
3. Interventions, such as urban regeneration, involve the government intervening in complex adaptive systems, where public agencies are not in full control of the outcomes. In this context, it may be necessary to measure the features of the system or network (how often do interactions take place, with whom and for what purpose). However, this is often not immediately interesting to the public and measuring network characteristics requires particular methods.

This handbook also offers some tools to address these problems of measurement. Logic models can provide a structured way to identify what it is important to measure, economic evaluation can be especially useful where costs and benefits can be monetised, futures thinking can help when considering long-term future impacts to measure, impact assessments provide a helpful way to provide an array of outcomes to measure, and standard cost modelling can provide a way into understanding the categories and ranges of costs.

1.5 For whom? Dealing with multiple stakeholders where costs and benefits are unevenly distributed

Costs saved to the taxpayer, for example, or improved delivery for the same resource, are (other things being equal) unequivocally good things. However, most performance audits come up against the problem that costs and benefits are unevenly distributed, that those who contribute most might not be the beneficiaries, and that benefits might be incommensurate (an economic saving for one might involve a loss of privacy for another). Many

important issues of the day (such as climate change, migration and security) involve managing risks rather than delivering measurable outcomes (the risk might have been well managed whatever the outcome) (see Beck, 1992; cf Culpitt, 1999). Furthermore, the costs or the benefits might be in the future and contingent upon developments over which public decisionmakers have little control. To complicate matters still further, different groups might value the same outcomes differently. For example, certain types of consumer might value front of pack labelling on nutrition very highly while others might primarily be interested in place of origin.

In this context, the performance auditor might draw upon chapters addressing how to understand how service users value different packages of service, how to estimate future costs and benefits, and how to understand the risks being managed. Delphis can help to identify future risks and futures thinking can help to identify the dimensions and categories of future costs and benefits. Discrete choice modelling is an essential tool if we are to understand how individual service users value the different possible options. Impact assessments show how to structure an array of costs and benefits across multiple stakeholders and stakeholder analysis can help understand stakeholders' values and priorities. All of these are discussed in later chapters.

1.6 Further reading

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CHAPTER 2
A framework for understanding the contribution of public services to public benefit *Tom Ling*

2.1 Performance audit and causality

In the previous chapter we noted how the changing architecture of accountability and delivery is provoking many changes in the practice of performance audit. Performance audit aims to understand what difference a service, regulation, or other activity makes, at what cost, and who bears the costs and receives the benefits. It is therefore concerned with the contribution made to achieving desirable outcomes and minimising undesirable costs and consequences. Sooner or later this requires some consideration and understanding of attribution, contribution and causality, often in the context of complex interventions that may evolve over time. This is not the place for an extended methodological discussion but it is important that as we consider how to apply methodologies outlined in later chapters, we do so within a framework informed by a plausible understanding of how we might conclude that public services contribute to or detract from the well-being of society.

Performance audit often includes a "Why?" question inviting a causal explanation. This might be why a particular health intervention delivered significant health benefits or why an anti-crime programme failed to reduce crime. It is immediately apparent that these are unique events and as such do not allow us to conduct experimental or quasi-experimental studies to understand causality. Instead, we are invited to develop a narrative account of why something happened which can provide the basis for an audit judgement.

2.2 Performance audit and judgement

Performance audit, in common with evaluation, involves a number of activities leading to an exercise of judgement (Schwandt, 2008). Performance audit bodies therefore seek to arrive at judgements which are seen to be legitimate (Hurteau et al., 2009). This requirement for legitimacy is one of the many ways in which academic research is distinct from performance audit. Being seen to be legitimate might involve five steps (similar to those identified by Scriven, 1980):

1. Agree with stakeholders the performance criteria applicable to the service in question.
2. Agree the performance standards and intended outcomes that are applicable.
3. Gather data relating to these standards and outcomes.
4. Assess the contribution made by the agency/activity in achieving these standards and outcomes.
5. Form a performance audit judgement.

These steps protect the audit body from the accusation of being arbitrary or otherwise non-rational. All performance audit bodies have different stakeholders related to their particular context. Should audit bodies develop performance criteria that are irrelevant to these

stakeholders (elected politicians, managers, professionals, users, taxpayers, for example) then they might not be seen to form legitimate judgements. We have seen a trend towards performance auditors taking on a wider set of stakeholder interests and demonstrating concern with wider issues such as user satisfaction, adherence to professional values, the effectiveness of cross-government working and so forth, in addition to more traditional concerns such as value for money and conformity with policymakers' intentions.

Performance audit bodies will not only seek to identify acceptable performance criteria (the domains of measurement) but also acceptable performance standards (the levels that should be achieved). They may also seek to influence these standards. For example, a RAND study showed that what was considered to be an unacceptable level of error in social security in the UK was in fact broadly in line with what was achieved in other countries, highlighting the apparently inherent nature of error in complex social security systems and lowering the threshold of what was considered to be acceptable (National Audit Office, 2006). The third step involves understanding the contribution made by the service to achieving the standards or outcomes. A characteristic of performance audit is that it is clearly oriented towards collecting and analysing data that helps to identify and assess the contribution made by a particular set of activities. Finally, an audit judgement can be drawn informed by understanding this contribution. In this chapter we suggest a coherent approach to understanding this contribution, suggesting that, following Mayne, a pragmatic place to start is with the underlying theory of how the activities were intended to produce these benefits.

2.3 Theory of Change approaches and performance audit judgements

The performance audit judgement rests upon a sequence of related statements:

1. The thing being audited was intended to achieve or contribute A (particular criteria and standards).
2. It actually achieved or contributed B (a particular level of performance).
3. The reasons for this are C,D, and E.
4. A contribution of A might have been expected, but we now know that there were particular additional factors to take into account, consequently our view on performance is F, and the lessons we derive for the future are G.

To succeed, these steps must provide – implicitly or explicitly – an analysis of how the programme, agency or activity was supposed to work, an analysis of what actually happened (including compelling evidence) and a judgement about what should have happened (was it a consequence of the design, the delivery, or external factors). Achieving these steps to arrive at a legitimate, non-arbitrary, rational basis for audit judgements is made easier, we suggest, using a *Theory of Change*.

2.4 The Theory of Change

Implicitly or explicitly, many evaluations of complex interventions use a Theory of Change (ToC) approach.[1] These evaluations aim not only to understand the contribution made by a programme or activity to achieving outcomes, but also to interrogate evidence and commu-

1 We do not always find it helpful to use the language of 'Theory of Change' but the approach has under-pinned our work for clients including the National Audit Office, the Department of Health, DG SANCO, The Health Foundation, Tommy's the Baby Charity, the Papworth Trust, and others.

nicate findings to support both learning and accountability.

Our approach takes as its starting point the argument of Weiss (1995) that:

> The concept of grounding evaluation in theories of change takes for granted that social programmes are based on explicit or implicit theories about how and why the programme will work… The evaluation should surface those theories and lay them out in as fine detail as possible, identifying all the assumptions and sub-assumptions built into the programme. The evaluators then construct methods for data collection and analysis to track the unfolding assumptions. The aim is to examine the extent to which programme theories hold…the evaluation should show which of the assumptions underlying the programme are best supported by the evidence.

In this sense, ToC is an approach rather than a methodology (its successful delivery requires harnessing a range of methodologies such as those outlined elsewhere in this document). Our ToC approach has five precepts. Individually these precepts are, in our view, neither controversial nor radical but taken together they provide a firm and pragmatic base for performance audit. First the approach requires us not only to look at the outcomes of the programme but to pay equal attention to processes. This contrasts with more classical evaluation approaches which tend to look at outcomes first and then to look for evidence to support attribution. Second, the approach requires a more embedded evaluator where the auditor works closely with policymakers, practitioners and end users to understand and elaborate a sometimes changing theory of change. Without losing their independence, successful auditors will understand the world of the policymakers, practitioners and service users, including an understanding of what motivates their behaviour. Third, the approach requires an ability to reconstruct and represent the sequence of events connecting actions to each other and how these contributed to the outcomes identified, reconstructing at least the sequence of events and statistical covariations, but preferably also identifying the causal mechanisms at work. Fourth, the approach is sensitive to the possibility that during the life of a programme or intervention, initial theories of change may change in response to learning or to exogenous events and that the evaluation should capture these changing understandings and actions. Fifth, it will also be sensitive to the fact that different and potentially conflicting theories of change might be simultaneously pursued within any one programme; the thing being audited can often be a terrain upon which different values, interpretations and interests play out their differences. Collectively, these precepts describe an interest not only in *causal effects* (what happens when an independent variable changes) but also in *causal mechanisms* (what connects causes to their effects); not only what officials *say* they do but what the evidence *shows* they do; and not only what contribution stories practitioners tell themselves and others but also what really *contributes* to public benefit.

2.5 Building the "contribution story"

The approach to performance audit outlined here could give rise to varied practices amongst audit bodies. In putting these rather abstract arguments into practice we would advocate developing what Mayne (2008) calls the "contribution story"; that is, to understand why practitioners and policymakers believe

that their use of resources (money, authority, expertise, time, etc) will contribute to public benefits and what side-effects and unintended outcomes they envisage. Of the myriad things that could capture the performance auditors' gaze, taking the contribution story as the starting point increases the chances of both supporting accountability and improving future practice. Data collection then supports or weakens these narratives. Pragmatically, we agree with Mayne (2001) that in "most cases what we are doing is measuring with the aim of reducing uncertainty about the contribution made, not proving the contribution made". This allows auditors to narrow down the potential range of questions posed by a more general (and sometimes abstract) ToC approach and to focus on the things service users, practitioners and policymakers most need to know. In practice, we therefore need a tool for developing and understanding the contribution story that we can use to make sense of the (sometimes varying) claims made. We suggest that Mayne's approach is a pragmatic way of dealing with the reality that most performance evaluations are not aiming to achieve statistically valid accounts of attribution in relation to multiple repeatable events. Rather, they are typically concerned with unique events that may have unfolded in unintended ways, with intended outcomes that were possibly unclear, not agreed and in any case changed during the life of the intervention. Understanding contribution, rather than proving attribution, becomes an important goal of performance audit. The alternative is for performance auditors to endlessly complain at the real world's inability to organise its affairs as if they were part of a randomised controlled trial.

The contribution story provides benefits for performance audit by making explicit prior assumptions. Not only does this provide focus for the performance audit as a study but also any findings are likely to be relevant to the world view of practitioners and stakeholders. However, an important limitation is that they may also be subjective and that a variety of contribution stories may be held at any one time. For these reasons, the contribution stories exist to be interrogated and tested in the light of the evidence collected and are not a substitute for analysis. The purpose is not simply to make visible contribution stories but to subject these to careful analysis.

In later chapters we discuss the use of two tools that can support the interrogation of the contribution story; process maps and logic models. Either of these can be used to achieve some initial clarity about the contribution story. Two things should be made clear about them: first, they are a starting point for data collecting rather than representing the programme/project itself (they generate mini-hypotheses to be assessed); and second, they have their own limitations, which we identify in the relevant chapters. They can also be used at the reporting stage to communicate findings should this be helpful. In this sense they should be used pragmatically as stepping stones to understand the causal chains in the ToC or as vital parts on the contribution story.

But, to repeat, we are interested in testing these against independent evidence that supports or weakens the contribution stories, and also in understanding how motivations are shaped (perhaps by institutional change), how information is made available, processed and acted upon, and how capacities in particular respects are weakened or strengthened. This is not unlike the process-tracing approach of George and Bennett (2005), but we would always want to support this with strong statistical evidence of causal effects where feasible. Finally, we are aware of the need to be sensitive to context, reflecting the realistic evaluation mantra that "mechanism + context = outcomes"

(Pawson and Tilley, 1997). The importance of context encourages caution before believing that success achieve in one place can automatically be replicated elsewhere. We suggest that benchmarking at least and rigorous comparator data at best are crucial to this process.

2.6 Practical steps to understanding the contribution of public services to public benefit

John Mayne (2001, p. 9) has outlined six steps in contribution analysis. Here we present a variation on this and link it to the particular issues related to arriving at a legitimatised audit judgement (indented as bullet points below). The steps towards understanding contribution are:

1. Identifying the formal contribution story from documentary analysis.
   - Identifying agreed performance criteria, performance standards, and expectations.
2. Identifying tacit and informal assumptions through interviews with practitioners and wider stakeholders; participant observations, etc.
   - Identifying tacit and informal performance criteria and standards and stakeholder expectations.
3. Understanding if there is a shared contribution story and, if not, identifying variety of stories used by analysis of qualitative data.
   - Identifying what performance standards are/were anticipated and regarded as legitimate.
4. Identifying what kind of evidence would be needed to support these stories through logical analysis and literature review of related approaches.
   - Identifying what data would be needed to determine actual performance standards.
5. Identifying the available evidence (made available by the auditee, wider stakeholders and literature).
   - Identifying what the available evidence shows and what evidence is regarded as robust and appropriate by stakeholders.
6. Filling any essential evidence gaps using appropriate methodologies and within the budget constraints of the audit.
   - Identifying and collecting additional evidence, including that on unanticipated outcomes and comparator data.
7. Weighing the strength of the available evidence (assessing evidence for its independence, validity, replicability, etc).
   - Developing a performance judgement based on a credible account of the contribution made and minimising the uncertainties surrounding this contribution.
8. Providing an analysis of the varying stories and their evidence base.
   - Producing the final audit report.

2.7 Conclusion

Using Mayne's contribution story approach to underpin a framework for understanding the contribution of public services provides a pragmatic and non-arbitrary basis for supporting performance audit judgements that should be widely held as legitimate. It simultaneously ties the data collection and analysis to the world view of practitioners and it provides a methodological basis that addresses the problems of studying unique events, unfolding interventions and activities that might have multiple meanings and purposes.

CHAPTER 3
Building your own toolkit and capacity set *Tom Ling*

3.1 Fundamental questions in performance audit

In Chapter 1 we outlined the claim that current trends in public services are creating a more demanding terrain for performance auditors and prompting the need for more sophisticated methodologies. In Chapter 2 we outlined a pragmatic approach that performance audit might adopt in relation to this challenge. However, despite this proposed response to the shifting architecture of accountability and improvement, the fundamental questions of performance audit remain unchanged. Individual studies may focus on one or other of these but there are essentially six questions to be asked.

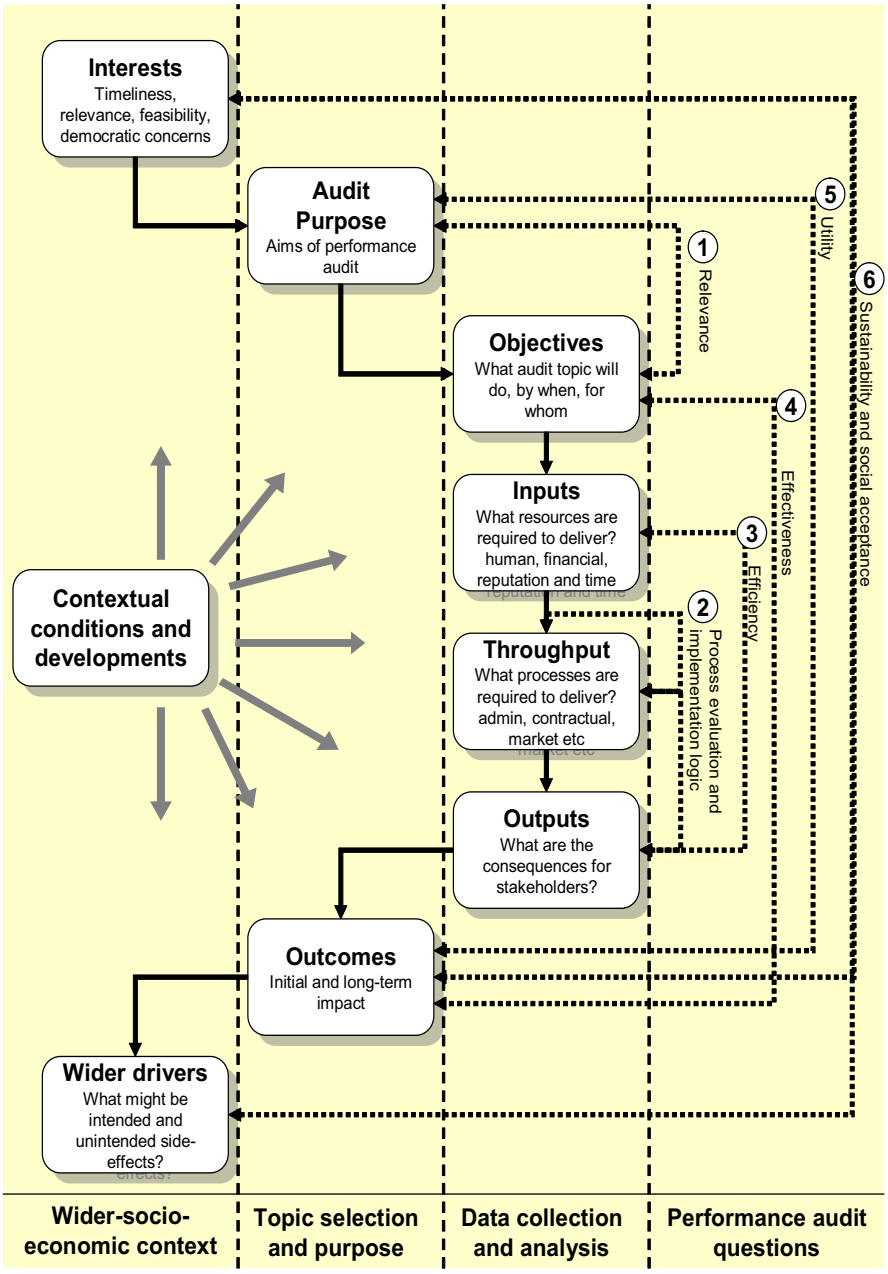
1. Relevance: Given the aim of the policy, was this the best way to deliver it? In modern governance the instruments available are extensive and include hierarchy, professional empowerment, contractual, market, network-building, and research. Performance auditors want to understand the evidence base behind the selection of instruments.
2. Process evaluation: What processes have been used, what was intended, what happened, and what have we learned?
3. Efficiency: Have resources been secured at the right price and have they been made available at the right time and in the optimal quantities?
4. Effectiveness: Have resources and processes been used to achieve the intended outputs?
5. Utility: Are the outputs and the intended outcomes and benefits of value and, if so, to whom?
6. Sustainability and social acceptance: Will the outcomes fit with the wider socio-economic drivers of change to produce desirable and socially acceptable long-term change?

Answering these questions requires data collection and analysis activities (the third column in the diagram below), but in considering what toolkit might be needed for this, it is important to understand how these questions fit within the fundamental questions of performance audit.

Within this framework, what should find its way into the suite of methodologies available to the performance auditor? The choice of a particular approach/methodology is limited by three constraints (cf Bamberger et al., 2006).

- **Time and budget availability**. At the National Audit Office, for example, Value for Money studies (the NAO term for performance audit) often take place over a 10-week period, which dictates the scope of the study as well as to some extent the choice of methodologies. For example, methodologies that take longer to set up and run than is available within the time allocated for the study may be avoided. The trade-off between addressing matters of current importance in a timely manner and adopting the most academically appropriate one is real and inevitable. Additionally, the available

Figure 3.1: Framing the fundamental questions of performance audit



suite of methodologies is also inevitably limited due to the budget available for the study as well as to their underlying costs. Performance audit cannot be immune to a cost-benefit analysis and therefore trade-offs between costs and robustness are likely.

- **Availability of data**. Data is more readily available to answer some performance questions than others. More sophisticated methodologies, such as financial analysis or modelling exercises, may be difficult to complete because data collected for one purpose is not suitable for another – for example a performance audit. This may lead to a pragmatic use of secondary analysis of data with the likely result that there will be more descriptive findings. In addition, the problem of poor and patchy data leads to the adoption of mutually reinforcing methodologies in order to triangulate the evidence and produce robust findings.
- **Practicality of passing the clearance process and securing legitimacy**. The choice of methodologies is also a function of practical factors such as the ease with which certain methodologies pass the clearing process and will be regarded as legitimate. Tried and accepted methodologies might create fewer difficulties and ensure that discussion is focused on accountability and learning rather than methodology (which would most probably be unrewarding for both citizens and practitioners).

These are real and in some senses inevitable constraints. However, in building capacity, performance auditors can address (but not remove) these in the longer term.

3.2 Building capacity to select and use the most appropriate methodologies

To an important degree, the constraints listed above are external to the performance audit organisation. However, there are measures that performance audit bodies can take to mitigate these constraints:

- **Poor data availability**. Poor data availability is the consequence of a mix of factors and circumstances, but not all of these are external to the audit body. Most significantly, the ad hoc nature of many performance audits acts as a disincentive to the regular collection of data. The development of a data strategy would allow auditors to collect and store data on a regular basis to provide a set of longitudinal data capable of strengthening a range of studies. There is a cost associated with this and it could be seen to distract from the performance auditor's core business, but there may also be important benefits.
- **Diversity and mix of skills.** It is unlikely that any audit body would commit the resources needed to fully cover the mix of skills required to successfully use every methodology listed in this handbook. However, a strategy for developing in-house skills and identifying which skills to outsource would improve the options open to audit bodies in the longer term. This would also allow external consultants to identify opportunities and to develop their own capacities.
- **Use of methodologies and associated buy-in from the service deliverers.** In the public sector, performance auditors frequently have auditees who themselves have considerable analytical capacity. On the one hand, it would be a poor use of public money to ignore a potential source

of research and analysis. On the other hand, performance auditors must be able to independently verify their findings and there is a danger that data produced for management purposes might not be helpful for accountability or lesson-learning purposes.

However, performance auditors also face challenges that they have less control over. One in particular can be the endless reorganisation of the service they audit. There is no basis for arguing that, for the convenience of performance auditors, public services should be obliged not to change but, conversely, public services that constantly reorganise can be hard to audit. Accountability can be easy to evade and lessons hard to learn. With multiple restructurings occurring, performance auditors have to rediscover who is responsible for what, and more importantly, staff has to work on rebuilding the confidence with their new counterparts in the auditee.

3.3 Tailoring the performance audit toolkit

Not all performance audit bodies have the same requirements. They might require a distinct mix of the methods outlined here but they might also require some additional methodologies to meet their circumstances. Tailoring the toolkit should involve discrete steps.

First, it is necessary to map the core business of the performance audit body. For example, this could be done in the form of a *value tree*. In this section we draw upon collaborative work between RAND Europe and the UK National Audit Office HMRC (Her Majesty's Revenue and Customs) team to illustrate the steps required. In the broadest sense on the cost side, these performance areas are the costs incurred by HMRC in administering the tax system and the costs to taxpayers of complying with the tax code. On the benefit side, the areas of performance include higher rates of compliance, savings that HMRC makes and improvements in service delivery (see Figure 3.2).

Subsequently, the RAND Europe study team identified a range of performance indicators in each sub-area. These performance indicators are published in the annual reports of other tax administrations and in reports by the Organisation of Economic Cooperation and Development (OECD). Two RAND Europe publications have analysed these indicators in depth and the RE study team took the indicators from these reports (van Stolk and Holmes, 2007, van Stolk et al., 2006). The main purpose of including these indicators is to show how other tax administrations assess performance and what specific aspects of performance they are measuring.

Finally, we listed a range of methodologies that could be used to gauge performance for each sub-area. The methodologies are not specific to certain performance indicators; mostly more than one methodology can be used in a sub-area or even to measure a specific performance indicator. Rather, the list represents a range of methodologies that can be used in a specific performance area.

From this, it is possible to develop a set of diagrams that trace the sorts of high level methods that might be required in this area of performance auditing. Below this level we can see how we might dig deeper into costs and then benefits (figures 3.2-3.6).

Figure 3.2: First level view of toolkit

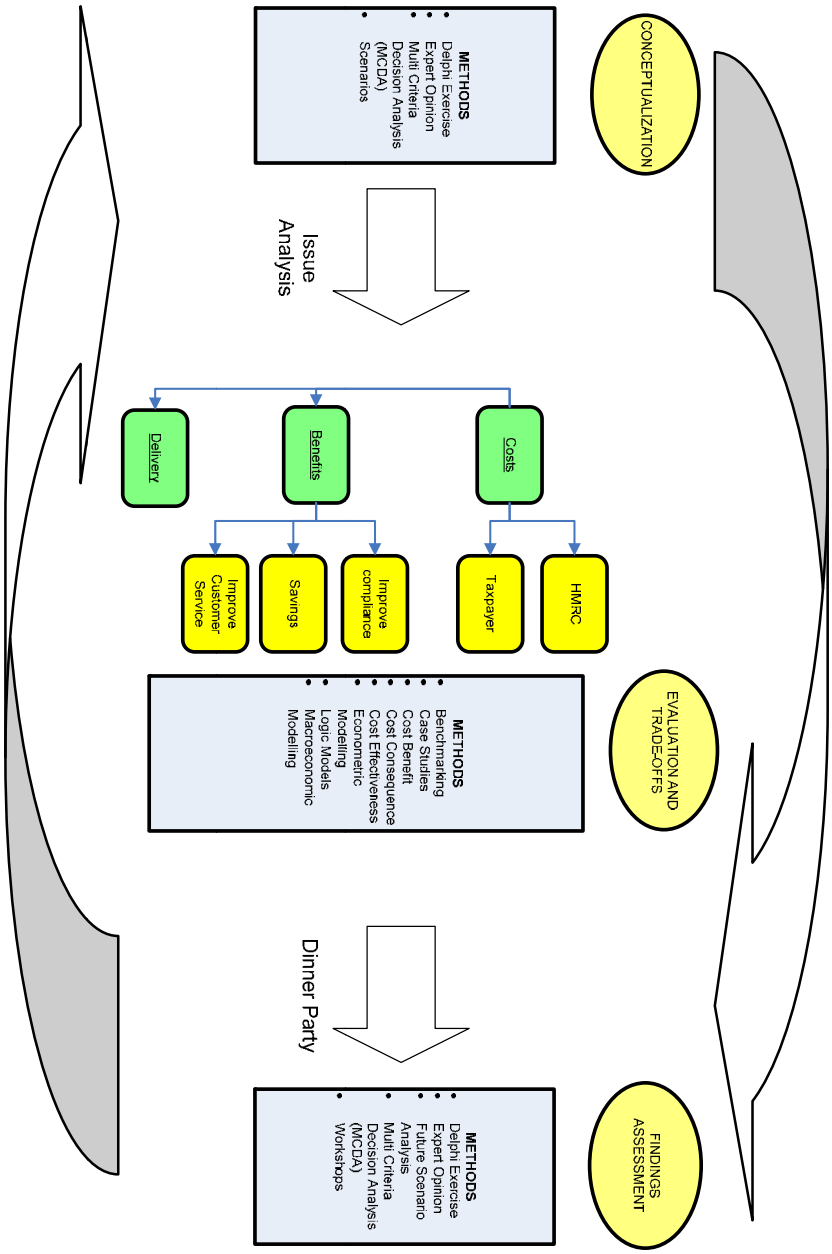


Figure 3.3: The area of costs in the toolkit

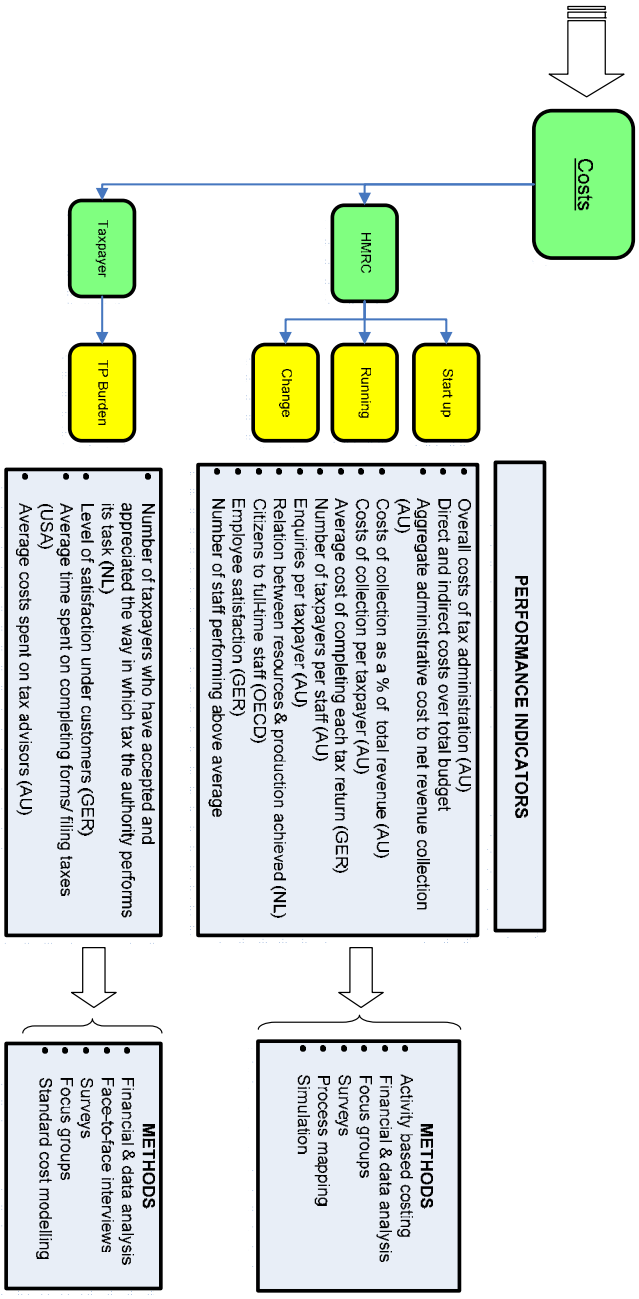


Figure 3.4: The area of benefits (compliance) in the toolkit

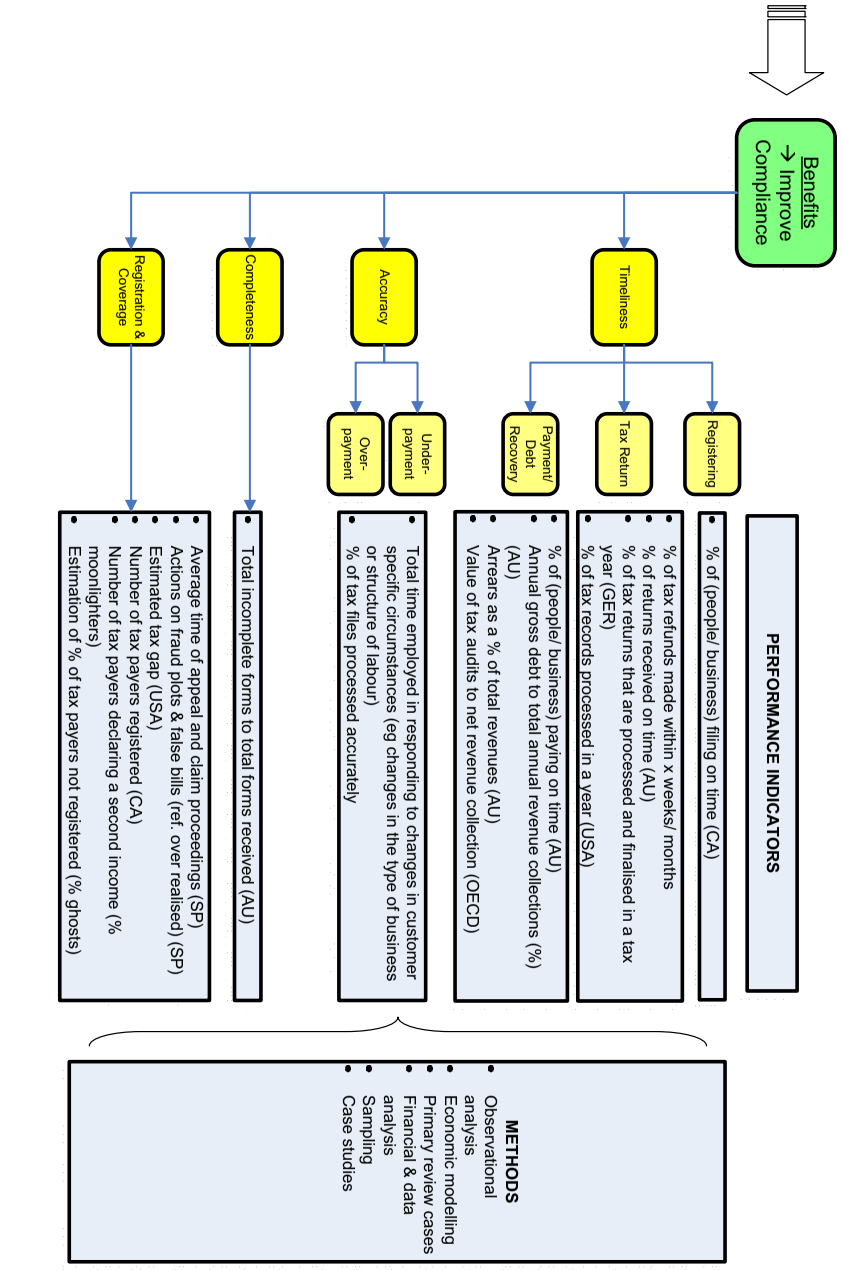


Figure 3.5: The area of benefits (customer service) in the toolkit

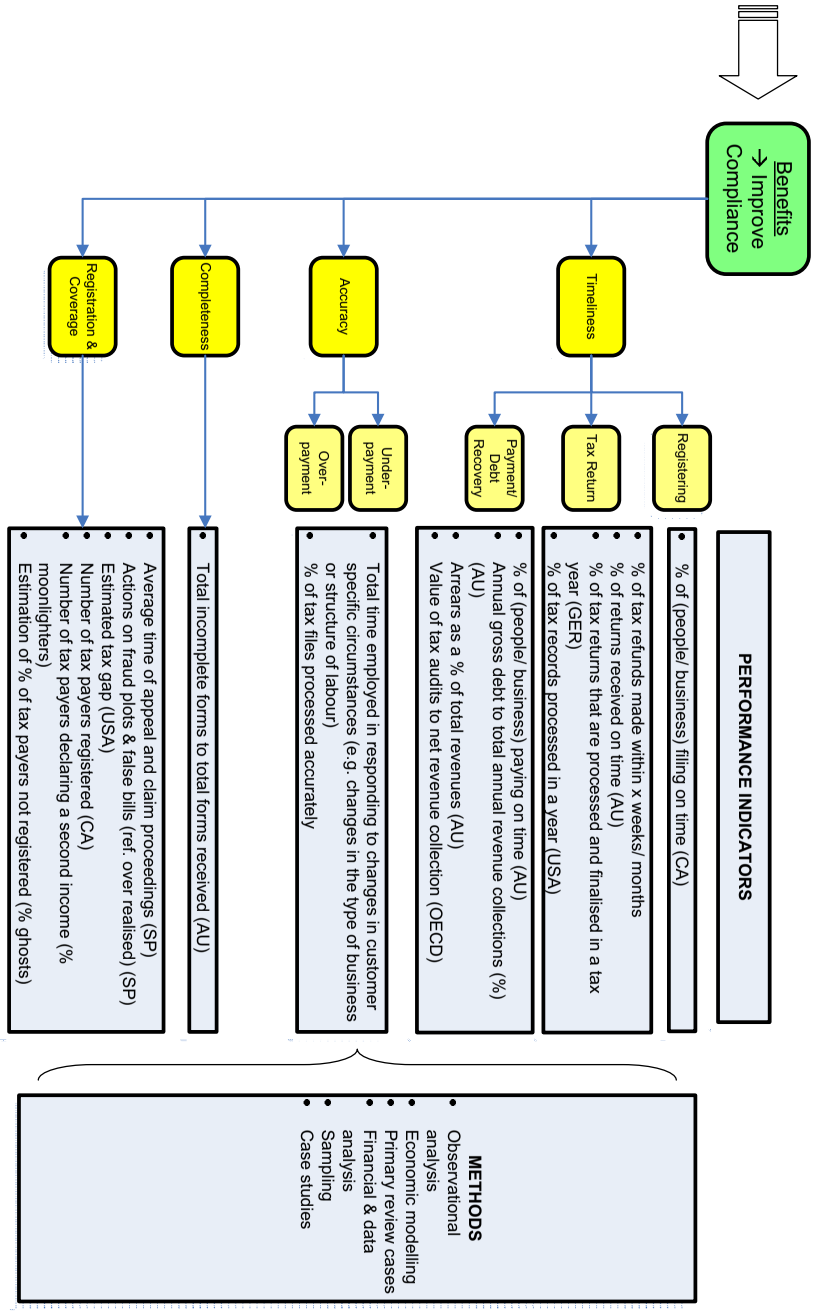
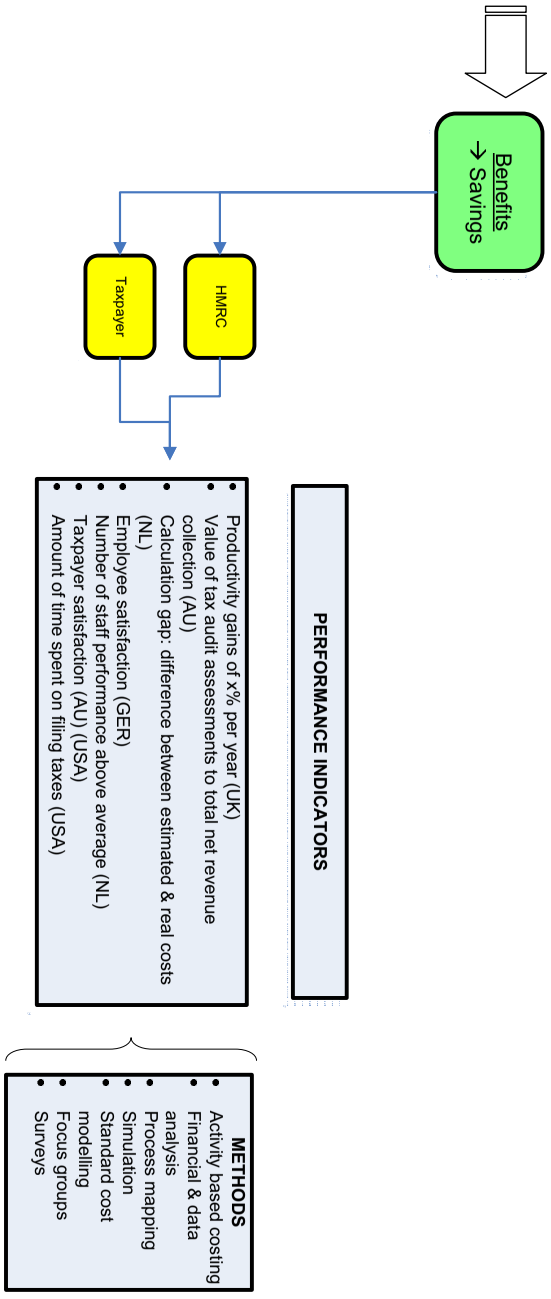


Figure 3.6: The area of benefits (savings) in the toolkit



3.4 Concluding remarks

This approach to tailoring the performance audit methodology toolkit is still a work in progress. In the illustration referred to in this chapter, the NAO may edit this output and may customise particular elements of the toolkit, for instance by making the performance indicators as relevant as possible for the HMRC context. It should not be taken as the NAO view but it provides an illustration of the way in which each subsequent chapter might be used. It does, however, reflect our understanding at RAND Europe, although this is presented here as a basis for further discussion. It suggests how audit institutions and the teams within them might build up a coherent approach to selecting a suite of methodologies to which they wish to have access.

CHAPTER 4
Benchmarking *Philip-Bastian Brutscher*

4.1 Key points

- Benchmarking is a method of comparing performance or processes across and between organisations, policies or policy systems, and across or between countries.
- Benchmarking in the public sector is used to identify and learn from best practice.
- Benchmarking follows a five-step procedure, and is an iterative process.

4.2 Defining benchmarking

The traditional definition of benchmarking is "the continuous process of measuring [outputs and processes] against the toughest competitors […]". We expand that to describe benchmarking as a way of comparing outcomes, processes or systems. The core idea is to learn through a structured process of comparison.

Benchmarking originated in the private sector in the 1980s, when the Xerox Corporation realised they had to study their competitors to find out why they were losing market share. The disturbing results led to the company adopting a systematic process of comparing factual data across a range of performance dimensions (How big is the gap?) and practices or processes (What are they doing differently – and better – than us?). The impact of this approach on Xerox is widely held to have been critical, not least because it warned "of a crisis before that crisis actually overtook and incapacitated the firm" (Bessant and Rush, 1998).

The main objectives of using benchmarking in the public sector context are:

- to get a general idea of what is being done, how and with what outcome across different public sector organisations/ policies/policy systems
- to compare the specific performance/ processes of certain public sector organisations/policies/policy systems
- to generate ideas of what can be done, how and with what outcomes.

There are several types of public sector benchmarking, the most prominent being:

- performance benchmarking, which compares the performance (in terms of outputs and outcomes) of different entities and assesses whether they make efficient and effective use of their resources compared to similar entities
- process benchmarking, where the processes and procedures of entities that are likely to lead to different outputs and outcomes are analysed and compared
- domestic benchmarking, which compares the performance and/or processes of similar entities within one country
- international benchmarking, which compare entities from different countries.

Another way of looking at benchmarking is in terms of the subject of the evaluation. Groenendijk (2004) distinguishes between the benchmarking of public sector organisations, public policies and policy systems, and points out that the focus of benchmarking public sector organisations is typically on processes and/or outputs, whereas benchmarking public policy is concerned with policy outcomes (such as economic growth, unemployment, etc). The main difference between benchmarking public policies and benchmarking policy systems is that policy systems deal with a multitude of policy outcomes, whereas policy

benchmarking typically involves a single set of coherent policy outcomes.

4.3 When to use benchmarking and when not to use it

Benchmarking is applicable in any situation where separate entities or activities need to be compared in order to identify and learn from best practice. The key question is what type of benchmarking is most appropriate, and will yield the most useful information.

4.3.1 Performance vs process benchmarking

The question of whether to use performance or process benchmarking depends largely on the objective of the evaluation. If the objective is to compare the overall performance of similar organisations/policies/policy systems, then performance benchmarking is the more appropriate choice. If, on the other hand, in the objective is to examine and compare standard processes (such as the way complaints are handled), process benchmarking is a better method.

However, evaluation objectives are not the only consideration when deciding between performance and process benchmarking. Another factor is the complexity of the outcome being benchmarked – the more complicated the outcome, the less likely it is that we can rely on standards or results benchmarking alone, and the more important it is that we go into the process or processes that contribute to performance. For instance, while it may be difficult to benchmark illiteracy, it is far easier to benchmark the performance of public libraries. Similarly, it is easier to benchmark different organisations involved in conventional training than to benchmark unemployment.

4.3.2 Domestic vs international benchmarking

The main reasons for using international comparators include:

- a lack of similar domestic comparators
- evidence of exceptional international examples (in terms of performance/ processes)
- the goal of the benchmarking exercise being to generate ideas of what can be done, how and with what outcomes.

There are a number of potential problems with international benchmarking. One is that, whereas the institutional environment in which the different units operate in domestic benchmarking is identical or similar, the same cannot be claimed for international benchmarking. As a result, the findings from an international benchmarking exercise must be analysed more carefully and implications should be drawn with caution.

Another potential problem of international benchmarking is that it requires greater attention to data issues than domestic benchmarking, since "definitions, concepts, ways of data collection differ largely between ... countries (notably between the US, Japan and Europe)" (Polt et al., 2002). This problem is aggravated by the fact that internationally comparable statistics are not available for most processes underlying the development of performance. One implication, therefore, is that international benchmarking must aim at being cooperative. In cooperative benchmarking, the parties involved exchange first-hand information with the aim of mutually beneficial learning. In competitive benchmarking, on the other hand, one is often restricted to secondary sources of information and statistics. Polt et al. (2002) find that "[c]ountries often hesitate to enter benchmarking exercises if they fear to be ranked in league tables".

4.3.3 Public sector vs public policy vs policy system benchmarking

When it comes to benchmarking public sector organisations, public policies or policy systems, there are again a number of factors that influence which type of benchmarking should be used. Since public sector benchmarking is mainly concerned with process and short-term output (performance) benchmarking, whereas public policies and policy systems are concerned with long-term outcome (performance) benchmarking, as suggested by Groenendijk (2004), our understanding of benchmarking is one such factor.

While processes and outputs tend to occur immediately and, therefore, allow benchmarking of public sector organisations at all times, outcomes (such as improvements in unemployment) tend to occur with a significant time-lag and so delay the benchmarking process of public policies and policy systems. Related to this, whereas it is relatively easy to attribute processes and outputs, it is much harder to attribute outcomes to a certain public policy and/or policy system because of the many other factors that may influence outcomes over time (Brutscher et al., 2008).

This suggests that, whereas it may well be possible to benchmark processes and outputs of public sector organisations in the short term, if we are interested in the longer-term outcomes (or processes in a different institutional setting), benchmarking must be understood as a continuous learning process that identifies examples of good practices rather than best practice (Camp, 1989).

Of course, we may also be interested in benchmarking the outcomes (rather than outputs and/or processes) of public sector organisations. In this case, the same problems of timing and attribution apply and so the same broader understanding of benchmarking should be used. The severity of the problem in public sector organisations varies depending on the level of aggregation – ranging from activity levels to unit levels to organisational levels. Empirical evidence suggests that the lower the level of aggregation, the higher the chance that activities other than the one being benchmarked are included and falsely attributed (Georghiou, 2002).

4.4 How to conduct a benchmarking project

A five-step model can be applied to public sector benchmarking, viewing it as, in principle, an iterative process (Groenendijk, 2004).

- Planning: determining what is to be benchmarked, identifying benchmarking partners, generating data.
- Analysis of data: establishing performance/gaps.
- Integration: communicating benchmark findings, developing plans to overcome performance gaps.
- Action: implementing measures to enhance performance.
- Monitoring: observing and recording progress, recalibrating the benchmarking process, feeding back into the planning stage of the next cycle.

4.4.1 Planning

The first step comprises a number of activities: deciding on the objective for the benchmarking exercise; finding out which organisations (or units thereof), policies or policy systems carry out similar activities or have similar functions – that is, they are suitable comparators; and collecting appropriate data.

The main factors that should go into choosing benchmarking comparators or partners are the *availability of relevant and reliable comparative information* (Is a comparator prepared to provide the necessary information?) and *associated costs* (What is the added value

and cost of including an additional benchmarking partner?). As a rule of thumb, it is unlikely that one comparator is superior along all benchmarking dimensions, so the number of benchmarking cases should increase as the degree of *complexity* increases (eg going from public policies to policy systems).

We can use a number of methods to collect data. The most prominent are key informant interviews, focus groups, workshops, surveys, documentary and file reviews and visits (for process mapping). The exact method depends on the *availability of data* and *access to people* with information. In addition, it is important to bear in mind that different methods come with different *costs*. As a consequence, it is typically advisable to start with desk-based research (which is less resource intensive) and to complement this with primary data analysis only where no prior data exists.

4.4.2 Analysis of data

The key questions for analysing benchmarking partners are as follows. What are the differences and similarities between the partners? What are examples of good and bad practice? What factors seem to make a difference? What alternative explanations are there? What is the context of the results (for example, what social, economic or political environments influence the outputs/processes/outcomes of the benchmarking partners)? What changes are likely to lead to improvements? What are the associated costs?

4.4.3 Integration, action and monitoring

Steps one and two represent basic activities in a formal process of benchmarking. On their own, however, they result in little more than an indicator of where something stands in relation to others – providing a league table or performance indicator. To be a tool for learning, the results need to be communicated, recommendations formulated and implementation plans devised (including timescales and resources required). These plans then need to be continually monitored and updated. Furthermore, it is important to keep in mind that best practice is a dynamic concept and that what is being benchmarked against is unlikely to have stood still (Groenendijk, 2004).

4.5 International benchmarking in action – comparing hidden economies

The UK National Audit Office (NAO) commissioned RAND Europe to carry out a study placing the performance of HM Revenue & Customs in tackling the hidden economy in an international context. The study also sought to identify good practices used by other tax authorities that could be adopted by the UK (van Stolk et al., 2008).

The hidden economy affects everyone. Honest businesses suffer from unfair competition from those in the hidden economy. People working in the hidden economy do not benefit from the protection of employment legislation. Customers of people working in the hidden economy do not get guarantees for work carried out or have no legal recourse for poor quality work. From a government point of view, the hidden economy can lead to:

- tax losses
- benefit fraud, where unemployed people are engaged in undeclared work while claiming benefit
- avoidance of employment legislation, such as minimum wage agreements or health and safety and other standards in the workplace.

Tax authorities tackle the hidden economy to reduce the amount of tax revenue lost and to improve fairness for taxpayers who

comply with their obligations. There are various definitions for the hidden economy; for example, some include within their definition all forms of undeclared income, while others include only undeclared cash transactions. Tax authorities also use different terms, such as "underground", "hidden", "black", "shadow" or "cash" economy, to describe income that is undeclared for tax purposes.

In the first stage of the project, the NAO study team and the RAND Europe project team agreed on the objective of the study and a template of questions to be used for the country reviews, as well as selecting five countries to be reviewed. The template closely followed the following categories:

- general description of the revenue system and organisation of each country
- definition and measurement of the hidden economy
- strategy of tax authority
- key initiatives used by the tax authority
- results of initiatives.

The countries selected for comparison were Australia, Canada, Belgium, Sweden, and the United States. The selection of the countries took into account a number of criteria, including:

- similar demographics to the UK
- similar size of economy (GDP per capita)
- similarities in the set-up of the tax authority
- the availability of data and information/ research on the hidden economy and initiatives of tax authorities (given the short timeframe and budget constraints of this research, the RAND Europe project team felt that the study should focus on cases where data and information was more readily available from publications and web resources)
- variation in hidden economy indicators (some countries with a larger hidden economy, some with similar levels to the UK, and others with a lower level)
- evidence of interesting or innovative practices.

The data collection proceeded in two stages. In the first stage, members of the RAND Europe team were assigned countries according to their nationality, relevant experience and language skills. The team undertook an initial search to collate easily identifiable information through desk-based research, to identify potential sources and to establish contacts for less easily available information. Sources included:

- government, tax agency and policy publications in the respective countries
- documents from international organisations such as the OECD and IMF
- documents from international Supreme Audit Institutions
- documents from supra-national organisations such as the European Union
- publications from institutes involved in tax authority reform, such as the Taxation Institute of Australia and the Institute of Fiscal Studies in the UK
- other academic databases such as JSTOR and SSSR.

A mid-project meeting allowed the RAND Europe team and the NAO study team to share findings, identify difficult areas, draw out emerging themes for wider analysis, compare understanding of the questions in the template and identify areas for further investigation. The RAND Europe team then refined their investigation through further document analysis and through personal contact with informants in the countries selected. The interaction with the contacts ranged from phone calls to sending

e-mail inquiries for verification or additional information.

In the next phase, the RAND Europe project team synthesised the research and prepared the final deliverable, which consisted of a thematic comparative overview of the evidence found in the selected countries. The comparative analysis and reporting were structured around the following themes:

- estimating the size of the hidden economy
- tax authorities' strategies and organisation
- encouraging people into the formal economy
- detection
- sanctions.

The findings were communicated to HM Revenue & Customs by the NAO project team, recommendations were formulated, and implementation plans sketched out. The NAO continues to monitor developments following the project.

4.6 Summary

Over the past 30 years, benchmarking has become one of the most prominent evaluation methods. This is due, at least in part, to its conceptual simplicity. However, it is important to bear in mind that, despite this, an evaluator wishing to use benchmarking has to make a number of important decisions. These include what type of benchmarking to employ, what benchmarking partners to choose, what data to collect, how to analyse the data, and how to communicate results, formulate recommendations and monitor their implementation.

4.7 Further reading

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CHAPTER 5
Delphi exercises *Sharif Ismail*

5.1 Key points

- Delphi exercises are a structured way to collect large amounts of qualitative information from experts in fields relevant to the issue being examined.
- Delphi exercises use ranking, scoring and feedback to arrive at consensus on an issue or a set of issues.
- Delphi exercises are not aimed at predicting the future.

5.2 Defining a Delphi exercise

The Delphi method is a means for collecting large quantities of qualitative information – principally expert opinion – in a structured fashion. In its conventional, "pencil and paper" form, the Delphi method involves issuing questionnaires to participants in which they are asked to rank a series of items (in order of importance, likelihood of occurrence, etc) over a number of rounds, interspersed with feedback collection. The exercise is usually conducted remotely; there is no requirement for participants to be brought together in one place. The aim in *most* instances is to drive participants to consensus on the ranking of a set of issues, factors or events, but the method can be used in a more open-ended manner to reveal a *range* of options instead.

Broadly speaking, Delphi exercises involve four phases.

1. Exploration of the subject under discussion.
2. Reaching an understanding of how the group understands an issue through an iterative process of ranking and scoring.
3. Exploring where disagreements have occurred between participants – and the reasons underlying these disagreements.
4. Final evaluation – where all previously gathered data has been reviewed.

In the context of performance audit exercises, the Delphi method has a number of particularly advantageous features. First, it provides a structured means of collecting large bodies of qualitative and quantitative data[1] in areas in which other forms of evidence may be thin on the ground. This can be particularly useful when scoping potential performance indicators in an unfamiliar setting. Second, by helping to bring participants towards consensus, it enables users to prioritise lists of possible performance audit options in a structured manner. This could be applied at both the early stages of a project, to identify key audit questions, and at the concluding stages, to help prioritise recommendations.

How does the Delphi method differ from other consultative techniques (such as workshops and focus groups), and what advantages does it have over them?

- Larger exercises frequently yield a statistical group response, the results of which can be subjected to further analysis. This is not the case for focus groups and many other consultative approaches. Typical sample sizes for

1 Qualitative data collected from Delphi exercises can include open-text responses to questions. From a quantitative perspective, ranking lists produced by Delphi participants can be analysed statistically in a number of ways, ranging from basic descriptive statistics to more advanced measures of decisionmaking reliability between rounds, and preference differences between individuals.

Delphi exercises lie in the range of 30–120 participants.
- The Delphi approach provides anonymity for participants, which helps to ensure that group pressures are less of a factor in decisionmaking than they are in workshops, focus groups and many other consultative exercises.
- In contrast to focus groups and other face-to-face consultative approaches, there is no requirement that participants are physically present when the Delphi is run. Instead, they can provide feedback at their own convenience (within limits).
- Feedback can be collected in a structured way between rounds – meaning that the questionnaire can be adjusted if particular issues have not been taken into account, in a way that would be very difficult if not impossible using other methods, such as a conventional survey.

5.3 When to use a Delphi exercise

The conditions under which Delphis are most commonly used include occasions where:
- **The issue at hand does not readily lend itself to precise analytical techniques**: this occurs particularly in those instances where the evidence base is fragmented, patchy or even non-existent.
- **Subjective judgements gathered on a collective basis could help to inform decisionmaking**: in the context of performance audit, this is most relevant in two instances: (1) where the terms of the audit are not clear; and (2) where normatively defined terms are involved as an important basis for evaluation (eg "sustainability", "quality" and so forth) and it is important to clearly define these terms for the audience at hand by engaging expert opinion.
- **More individuals are needed than can readily be accommodated in a face-to-face engagement, such as a workshop**: in complex fields, or for large-scale audits, it may be that a large number of stakeholders need to be involved, and short of a full-scale survey, the Delphi method provides perhaps the most viable method for integrating them.
- **Required participants cannot easily be brought together in one location**: especially where some are based abroad.
- **Disagreements between individuals are such that face-to-face contact becomes difficult**: this situation could arise in politically sensitive areas, where it is important to ensure engagement and exchange between stakeholders, but face-to-face meetings would not be considered advisable.

5.4 What a Delphi exercise is not

Despite the symbolic resonance of its name, the Delphi method is *not* a way of "predicting the future". Though often considered part of a tool-box of futures methodologies, it is in reality simply a method for gathering expert responses and providing feedback to them in a structured fashion. Its occasional use for what appear to be predictive exercises – mainly to anticipate immediate developments in high technology industries or scientific research – masks the fact that these statements merely reflect expert *opinion* rather than a well-evidenced vision of future realities.

Nor is the Delphi method a robust replacement for a large-sample survey. In general, it is inappropriate to use this methodology when a very large number of stakeholders are to be involved (ie more than 200).

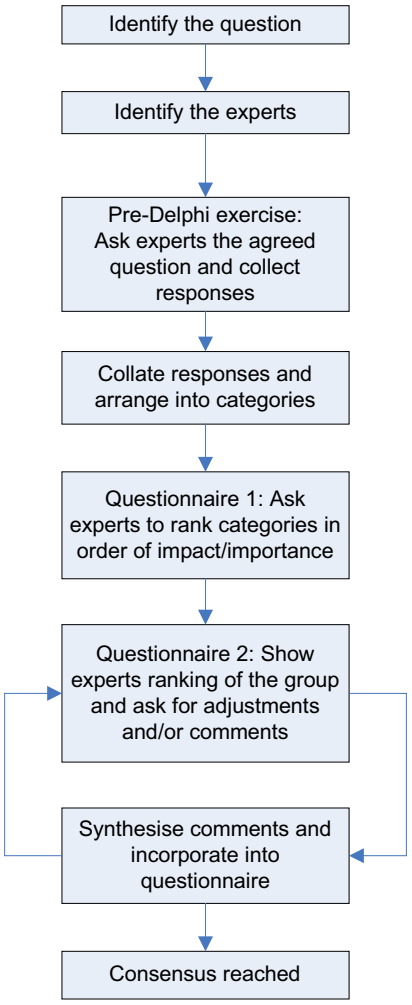
5.5 How to conduct a Delphi exercise

In this section we review both the basic approach to a Delphi exercise, and a series of modifications that may be considered based on specific requirements.

5.5.1 Basic Delphi exercise

A basic Delphi exercise involves six steps.

1. **Decide whether a Delphi is the most appropriate method to use**. In the context of a performance audit, a Delphi offers the greatest potential at the problem formulation and findings assessment stages, where a number of alternative appropriate methodologies exist. These include scenarios, stakeholder workshops, multi-criteria decision analyses (MCDAs) and so forth. The merits of each method need to be considered carefully before opting for a Delphi.
2. **Identify the question**. It is important to be clear precisely what the objectives of the exercise are. Is the aim to *produce consensus* on the conceptual approach to a performance audit problem? Or is the intention instead to get a sense of the *range of possible approaches* to a particular problem? Subtle modifications can be made to the process to take account of each of these aims.
3. **Identify the experts.** This step is complicated by the difficulty of identifying those individuals who may be considered "experts" in a particular field. For within-discipline exercises, this may not present a problem, but it becomes trickier when questions cross obvious disciplinary boundaries. The key is to be clear about the rationale for selecting your group of experts.
4. **Pre-Delphi exercise to formulate the questionnaire.** The pre-Delphi exercise provides the material for the questionnaire.



By putting the question to the identified experts and soliciting their responses to it, a rich initial data set of interpretations can be gathered. The list of responses is then collated and arranged into a set of categories that experts can rank in future rounds – this forms the basis of the questionnaire.

5. **Run the multi-round Delphi exercise.** Once the first–round questionnaire is

drawn up, the exercise can be launched. A mechanism for summarising the results for participants between rounds is needed, and most commonly this is done through a series of histograms, showing the distribution of rankings. This element of feedback may or may not influence the judgement of the participants in further rounds.

6. **Collect and analyse the results**. Depending on the particular approach chosen, a Delphi exercise will yield either (a) a ranked hierarchy of options, or (b) an unranked range of possible options. Importantly, though, the way results are collected from the participants may also enable further analyses to be performed on the results.

The approach outlined above is best described as a "conventional" Delphi. Since its inception, a host of modifications have been developed to respond to specific qualitative data collection requirements, and whether one of these modifications might be more appropriate to current auditing needs than a conventional approach should be considered. Each offers specific advantages in particular situations.

5.5.2 Delphis with pre-defined goals

Rather than involving participants in a costly and time-consuming pre-Delphi goal-setting exercise, it may be easier to launch the questionnaire directly. This is probably most appropriate if the issues under analysis are already well understood. Biasing effects are to some extent offset by the feedback mechanism built into the Delphi process, since this enables participants to suggest additional items for inclusion if they do not feel that the topic has been covered from a sufficient number of angles.

How are questions generated for the Delphi questionnaire without engaging expert participants directly? Possible approaches include:

- examining questions and goal sets from other, similar Delphi exercises conducted elsewhere
- synthesised literature reviews
- interviews with key informants (a major advantage of this approach is that it may improve participation rates in later rounds since experts are required to respond in a focused way from the outset).

An innovative example of this modification is the **RAND/UCLA Appropriateness Method**, which has become an important tool in the development of clinical guidelines in medicine, and in deciding on the appropriateness of particular medical procedures in a variety of contexts. Further detail on the application of this method in healthcare is provided in section 5.6 below.

5.5.3 Rotational Delphis

An important challenge when running large-scale Delphis is deciding how to deal with large data sets. It has been observed that participant attrition rates rise significantly when experts are asked to rank large numbers of items. In response to this, a rotational Delphi technique has been developed by a group of educational practitioners; it involves splitting large item sets into smaller groups, which are then rotated between sub-committees (Custer, Scarcella and Stewart, 1999). It is important to ensure that sub-committees are selected in a stratified way, to comprise a representative sample of the participants in the whole exercise.

5.5.4 Teleconferencing Delphis

Teleconference Delphis bring a large number of individuals together at one time while

maintaining anonymity. The main advantages of this method are:

- Live negotiation between individuals means that a consistent view of the assignment is often reached rapidly.
- It allows greater flexibility in the use of sources. While conventional Delphis tend to encourage participants to make judgements on the basis of summary statistics and numerical forecasts, there is in theory greater scope for use of other evidence in the context of a teleconference, where content can be explained in greater depth. The range of evidence might go from the anecdotal (participant experiences) to the visual (PowerPoint presentations, videos, etc).
- Efficiency, since the time between each round is considerably reduced.

5.5.5 Online or real-time Delphis

As with teleconferencing, an online or real-time Delphi is a modification of convenience. By assigning each participant a login code (against which their activities on an online Delphi site can be tracked), it may be possible to gather more regular participation.

5.5.6 Policy Delphis

Policy Delphis resemble the conventional model only superficially. In particular, they exploit the pre-Delphi questionnaire or brainstorming exercise, with less emphasis on a drive towards consensus in later rounds. Instead, policy Delphis are designed to expose the full range of approaches to a particular problem or question. They can be particularly useful during the conceptualisation phase of a performance audit exercise, before narrowing down to the most appropriate research question using another method.

What stages are there to a policy Delphi? Because of the need to gather as wide a spectrum of opinion as possible, particular attention should be paid to the way in which the Delphi is structured. Broadly, this should include the following steps:

1. formulating the opening research question
2. exposing the options through opinion gathering from participating experts

Table 5.1: Comparison between standard and real time (online) Delphi exercises

Type of consultation	Group size	Length of interaction	Number of interactions	Principal costs	Other features
Standard Delphi	Small to large	Short to medium	Multiple, delays between rounds	Monitor time; clerical and secretarial	Equal information flow to and from all
Real-time (online) Delphi	Small to large	Short	Multiple, as required by individual	Computer access; communications	Equal information flow to and from all

Source: Author

3. determining initial positions on the issue at hand, and highlighting areas of disagreement
4. exploring the underlying reasons for these disagreements
5. evaluating these underlying reasons
6. re-evaluating the options available to decisionmakers on the basis of this review.

In view of the kind of information to be collected, it is important to consider the scales used to rank items. While most conventional Delphis rely on a simple numerical rank for each item, policy Delphis tend to involve ranking items along a number of axes, particularly because the implications of a policy option may be unclear. Typically, policy Delphis ask participants to consider (1) the *desirability* of a measure (very desirable, desirable, undesirable, very undesirable); (2) the *feasibility* of a measure; (3) the *importance* of a measure; and (4) the *confidence* of the individual in the validity of the argument or premise.

5.6 Delphi in action: the RAND/UCLA Appropriateness Method in health settings

The Delphi method has been used extensively in healthcare settings and health services research. Applications have included efforts to help determine the most appropriate bases for performance management, for example a recent attempt in the UK to develop appropriate performance indicators for emergency medicine (Beattie and Mackway-Jones, 2004). It has also been used to understand key determinants of innovation in healthcare organisations (Fleuren et al., 2004), and even to estimate the global prevalence of key disorders, such as dementia (Ferri et al., 2006).

One of the best-known applications of the Delphi method in a healthcare context, however, builds on attempts by the RAND Corporation in the late 1980s and 1990s to develop a methodology for assessing the appropriateness of medical or surgical procedures. This culminated in the development of the RAND/UCLA Appropriateness Method, which seeks to combine the best available scientific evidence in a given area with a synthesis of the opinions of leading experts in that field, to give a robust assessment of the appropriateness of performing a particular procedure given patient-specific symptoms, medical history and test results. In this sense, a Delphi exercise forms part of a larger, evidence-gathering effort that includes literature reviews and sometimes primary research.

The details of the method and its application are described elsewhere (see Fitch et al., 2001, among others); below is an outline of the major steps in the process.

- Stage 1: Select a topic area.
- Stage 2: Conduct a review and synthesis of existing literature in the area in question.
- Stage 3: Develop a list of indications and definitions.
- Stage 4: Assemble an expert panel for the Delphi exercise.
- Stage 5: Develop rating scales for appropriateness and necessity of use of the intervention in question.
- Stage 6: Run the Delphi exercise to gather expert scores of appropriateness and necessity.

5.7 Summary

The Delphi exercise occupies a useful middle ground between the face-to-face interaction of individuals in a small group setting (eg a focus group) and large-scale data collection without direct contact (eg via a survey). It offers a robust means for driving groups of individuals to consensus, and has a range of possible applications in a performance audit context – most

obviously for reaching agreement between diverse groups of people on appropriate measures of performance.

5.8 Further reading

Adler, M. and E. Ziglio, *Gazing into the Oracle: the Delphi Method and Its Application to Social Policy and Public Health,* London: Jessica Kingsley Publishers, 1996.

CHAPTER 6
Discrete choice modelling *Dimitris Potoglou, Chong Woo Kim and Pete Burge*

6.1 Key points

- Discrete choice modelling is a technique employed to analyse and predict the choices individuals make regarding interventions or services.
- It is based on real and hypothetical choices (revealed preference – RP – and stated preference – SP – data) regarding a number of factors that describe improvement or policy change.
- Choice data can be monetised to help in cost-benefit analysis, used to weigh up the pros and cons of introducing or amending particular policies, or as a source of objective information on a difficult subject.

6.2 Defining discrete choice modelling

Discrete choice modelling provides an evidence-based, quantitative framework that enables researchers and policy makers to understand how individuals make choices when faced with different policy options or a number of alternative situations. In particular, discrete choice modelling helps to:

- identify the relative importance of the factors or attributes that drive individual choice
- construct alternative scenarios and predict public acceptance of policy interventions or proposed service improvements, or demand and market shares of products over the whole population (Ortuzar and Willumsen, 2001).

The types of research questions that discrete choice modelling can answer include the following.

- How will people react to changes in price of services or goods? For example, how would a change in the price of alcohol influence demand, or how many people would stop having regular dental check-ups as the price increased?
- How will people respond to a policy intervention that involves a new option? For example, how would patients respond if they were given a choice between hospitals, or what would drive people's choice of postal provider in a deregulated postal system?
- How do people value the different attributes of services? For example, how would people trade off time and cost (eg travel time, hospital waiting times), or how much would people be prepared to pay for improved public spaces?

The trade-offs that customers are prepared to make when comparing improvements in service attributes with increases in bill size is of key interest. Another measure here is *willingness to pay* (WTP), which expresses trade-offs in monetary terms that can feed into a cost-benefit analysis (CBA) framework. An important outcome of discrete choice modelling, which is less frequently reported, is the accuracy of WTP values, which can be used to provide guidance on the appropriate confidence intervals for these model outputs.

Since discrete choice modelling allows us to forecast choicemaking behaviour and demand for alternatives in future scenarios, discrete choice models can be embedded within *decision support systems* to allow analysts to test the potential impact of different policy interventions.

6.3 How to conduct discrete choice analysis

Box 6.1: Data elements in discrete choice modelling

Attribute: A policy element or a characteristic of a product or service such as price, waiting time, tax discount, etc.

Alternatives: The options that were considered by the individual in making the choice. These are described by a series of attributes.

Choice set: A finite set of a number of alternatives available to an individual.

For example, an individual may consider a number of different hospitals (*alternatives* within a *choice set*) that can be compared by describing them in terms of a series of *attributes* (eg waiting time, reputation) that are weighed up when making a choice.

Analysis of individual choice requires knowledge of what has been chosen, but also of what has not been chosen. This information may be acquired from Revealed Preference (RP) data and Stated Preference (SP) data. RP refers to direct observation of choices that individuals have made in real-life situations, whereas SP data come from hypothetical choices that individuals are asked to consider in a survey environment.

In an ideal case, we would develop discrete choice models using information on choices made in a real situation. From these data, we could quantify the influence of particular attributes or individual characteristics in real choice contexts (ie revealed preferences). There are, however, a number of potential problems with such data (Hensher et al., 2005, Louviere et al., 2000):

- what we think people are considering and what they are actually considering may be different
- the alternatives that individuals consider may be ambiguous
- the range and variation of the product or service attributes may be limited
- the attributes may be highly correlated (eg quality and price)
- the attributes may include measurement errors.

Moreover, there might be cases where direct observation is not possible, because some alternatives or certain characteristics do not yet exist (eg new technologies, new policy interventions, new environmental protection plans, etc).

These problems could be overcome if we could undertake real-life controlled experiments. The SP discrete choice experiments provide an approximation to this, a sort of quasi-experiment undertaken in a survey environment based on hypothetical (though realistic) situations set up by the researcher (Ortuzar and Willumsen, 2001). The main features of SP discrete choice experiments are as follows (Ortuzar and Willumsen, 2001).

Box 6.2: Elements of discrete choice model estimation

The models are constructed by specifying the range of alternatives that are available to the decision maker. Each of these alternatives is described with a utility equation.

Decision Rule: Each respondent chooses the alternative that provides them with the highest utility.

Utility: A function composed of a deterministic and a random component. The deterministic part of the utility is composed of attributes of the alternative itself and the decision maker. Each attribute in the deterministic part is multiplied by a coefficient (weight) that reflects the size of its impact on the decisionmaking process (Ben-Akiva and Lerman, 1985, Train, 2003). The random component is included on each utility function to reflect unobservable factors in the utility (this noise encompasses both factors that the analyst does not have insight into, and inconsistencies in the behaviour of individuals making the choices).

Estimation: The model coefficients are estimated in the model estimation procedure. The estimation can therefore be conducted within the framework of random utility theory, that is, accounting for the fact that the analyst has only imperfect insight into the utility functions of the respondents (McFadden, 1973). The most popular and widely available estimation procedure is logit analysis, which assumes that the error terms on the utilities are independently, identically distributed extreme values. The estimation procedure produces estimates of the model coefficients, such that the choices made by the respondents are best represented. The standard statistical criterion of Maximum Likelihood is used to define best fit. The model estimation provides both the values of the coefficients (the utility placed on each of the attributes) and information on the statistical significance of the coefficients (Ben-Akiva and Lerman, 1985).

Respondents evaluate hypothetical alternative options and choose one of the alternatives within a choice set. The choice decision is dependent upon the levels offered and individuals' own preferences.

- Each option is a composite package of different attributes.
- Hypothetical alternative options are constructed using experimental design techniques. These ensure that the variation in the attributes in each package allows estimation of the influence of the different attributes on the choices made.
- Alternative options are understandable, and appear plausible and realistic.

SP data have many useful statistical properties, since how the hypothetical choices are presented can be controlled so that there is little or no correlation between explanatory variables. The technique is also data efficient: more than one choice scenario can be presented to respondents within one interview. On the other hand, SP data are based around what individuals say they *would* do, which may not exactly correspond with what they actually do

when faced with the same choice or situation in real life.

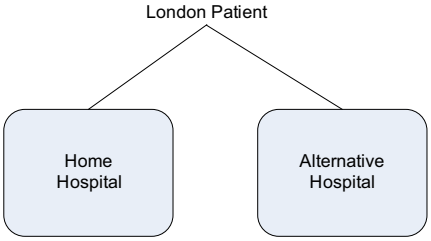
Therefore, RP and SP data can be complementary. Information based on RP data ensures that choices modelled are consistent with choices made in the real world, whilst information obtained from SP data can be used to strengthen the valuations of the relative importance of attributes, especially those that do not exist in real choices (Louviere et al., 2000). For this reason, some studies use both RP and SP datasets simultaneously in the estimation of discrete choice models, in order to draw on the strengths of both data sets.

6.4 Discrete choice modelling in action (1): revealed preference data/the London Patient Choice Project Evaluation

The London Patient Choice Project (LPCP) was established to improve choices for patients who were clinically eligible for treatment and had been waiting for treatment at an NHS London hospital beyond a target waiting time. As the target waiting time approached, patients were given an opportunity to choose from a range of alternative providers who had the capacity to offer earlier treatment. The aim of this study was to investigate patients' responses to these options for earlier treatment.

Within this study there was an RP dataset available that reported patients' choices to remain at their home hospital or to seek treatment at an alternative hospital. The sample included a total of 25,241 records from the LPCP database up to June 2004.

Figure 6.1: Choice context of London's patients



Source: Burge et al. (2005)

From the choices made by patients, it was possible to develop a model of the factors influencing the choice of hospital, including information on waiting times (both remaining and elapsed), travel times, reputation, specialty, patient age and patient gender. Tests were undertaken to examine whether there were differences in the valuation of each of the treatment-related variables between different types of patients. These tests did not reveal any significant difference in waiting time or travel distance between different socio-demographic groups of patients.

Analysis using discrete choice modelling showed that patients tended to minimise their waiting and travel time while trying to obtain treatment at a hospital known to offer a high quality of care (Burge et al., 2005). Older patients were more likely to stay at their local hospital, to which they had originally been referred. Male patients were more likely to decide to move to an alternative provider than their female counterparts (Burge et al., 2005). The models suggested that more patients would be willing to move to an alternative provider for ophthalmological treatments, while a larger number would stay at their local hospital for gynaecological treatments.

The findings provide valuable insights into what drives the choices made and thus enable policy makers to improve important

areas within the health care system, such as information on clinical quality and health outcomes. All factors examined are amenable to policy change and therefore the models could be used as a policy tool to examine a range of scenarios. This would provide insight into how different policies would influence choice as well as assist judgements regarding which outcomes are most desirable and whether the costs required to achieve them are justified. For example, if the goal of a policy is to encourage patients to switch to a short waiting time but a more distant hospital, this analysis demonstrated that all transportation should be organised by the NHS (even if paid for by the patient) and follow-up care should be at the home hospital.

6.5 Discrete choice modelling in action (2): stated preference data/evaluation of distribution network operators and willingness to pay for improvements in service

Ofgem, the industry regulator for the electricity and gas markets in Great Britain, commissioned research with the principal aim of determining domestic and business customer priorities and willingness to pay (WTP) for a range of infrastructure investments by the Distribution Network Operators (DNOs). This study has been used as input to price control negotiations for the period 2010 to 2015. Ofgem administers a price control regime which ensures that the DNOs can, through efficient operation, earn a fair return after capital and operating costs while maintaining an appropriate level of service and limiting costs passed onto consumers.

The design of the stated preference experiment was based on a list of prioritised service attributes and associate service levels (Accent, 2008, see Chapter 5). The attributes considered in the SP experiments differed for business and domestic customers. Both service improvements and reductions were tested, and the corresponding changes in the bill size were investigated in the stated preference experiments.

To ease the respondent's decisionmaking process, the attributes were divided across three choice experiments. The list of attributes in the Stated Preference experiment is shown in Table 6.1. Figure 6.2 shows an example of a stated preference exercise.

Data were collected through 2,154 in-home interviews and 1,052 business telephone interviews conducted in early 2008.

Table 6.1: Stated preference attributes

Experiment 1	Frequency of power cuts over 3 mins
	Average duration of power cuts over 3 mins
	Number of short power interuptions
	Provision of information
Experiment 2	Restoration of supply (time)
	Compensation for restoration of supply
	Making and keeping appointments
	Planned interruptions – notice
Experiment 3	Network resilience to major storms
	Network resilience to flooding
	Reduction in carbon emissions
	Energy efficiency advice

Source: Accent (2008, see Chapter 5)

Figure 6.2: An example of a choice experiment

Which electricity distribution service would you choose?

	As Now	**Alternative 1**	**Alternative 2**
Average number of power cuts longer than 3 mins in normal weather conditions	4 in 5 years	6 in 5 years (worse than now)	2 in 5 years (better than now)
Average duration of power cut	100 mins on average	100 mins on average	110 mins on average (worse than now)
Average number of power cuts shorter than 3 mins in normal weather conditions	5 in 5 years	3 in 5 years (better than now)	7 in 5 years (worse than now)
Information provided during power cuts	Automated messages of telephone operators to respond to customer calls	Automated messages or telephone operators to respond to customer calls, plus helpline for customers reliant on medical equipment	Automated messages or telephone operators to respond to customer calls, plus text messages to provide information updates
Annual Electricity Bill	£200 (no change)	£209 (£9 increase)	£209 (£9 increase)
Choice (mark "X" in preferred option)	☐	☐	☐

Source: Accent (2008, see Chapter 5)

The key findings of the stated preference choice experiments showed that, first, options offering equipment and vehicles using less polluting fuels were more likely to be selected by both domestic and business customers (Accent, 2008, see Chapter 8). Second, moving 5 percent of overhead lines underground per annum in areas of outstanding natural beauty and national parks for amenity reasons was valued higher compared to options offering none, 1.5 percent or 3 percent. Finally, domestic and business customers valued reductions in time taken to restore the electricity supply after a power cut, and reductions in power cuts, very highly. Compared to the baseline scenario of restoring supply within 18 hours, customers were more likely to choose scenarios offering restoration within 12 or 6 hours. This study also determined the willingness to pay for service improvements for both residential and business customers in all areas.

This research represents an evidence-based approach that helped to inform the next price control period, known as the distribution control review 5 (DPCR5), 2010 to 2015. In particular, the focus was on obtaining customers' preferences and willingness to pay for improvements to the level of service delivered, identifying any regulatory gaps that need to be addressed, and assessing whether DNOs offer quality of service and provide measurable benefits to customers.

6.6 Discrete choice modelling in action (3): combining revealed and stated preferences/the Isles of Scilly Travel Demand Model

The existing ferry service to the Isles of Scilly is nearing the end of its operational life and will be taken out of service after 2014. Cornwall County Council commissioned research to develop a travel demand model (see Kouwenhoven et al., 2007). The research also needed to quantify the benefits to travellers from different ferry service options to inform the cost-benefit analysis (CBA). The findings from this study have since been used by Cornwall County Council in a Major Bid Submission to the UK Department for Transport for capital funding support for improved transport links.

A series of surveys were designed to cover the three main groups travelling to and from the Isles: (1) day-trip visitors, (2) staying visitors and (3) island residents, business travellers and those visiting friends and relatives. Over 1800 face-to-face RP surveys were conducted with non-resident travellers to the Isles of Scilly to collect data on the travel choices that they had historically been making. Among those, 400 respondents went on to participate in a subsequent SP survey to focus on how their choices may change if the transport provision to the islands were to change. In addition, over 250 RP surveys posted to island residents were returned and of those, 60 took part in the further SP survey. All the surveys were conducted during the peak summer season in 2005.

Due to the importance of transport links to the Isles, the travel demand model needed to reflect both changes in modal shift and changes in total demand as a result of changes in ferry service level. In this study, both the RP and SP data were used jointly to estimate mode choice models. The models incorporated (household) income-specific cost sensitivity, resulting in income-specific values of access time and ferry time. For day-trip visitors, the values placed on changes in travel time by business travellers were found to be significantly higher than those of other travellers. For instance, the value placed on time spent on the ferry for day-trip business visitors was estimated at £24.07 (£/hour, 2005 prices). For day-trip private visitors, values of time were estimated at £11.82 for households with income less than £60,000,

and £16.09 for those with income of £60,000 or more. The study also provided evidence on the value placed on both the proposed new ferry and for the harbour improvements at Penzance and St Mary's. The models revealed that staying visitors would be willing to pay £13 for the new ferry compared to the residents' £7. Harbour improvements were valued at £5 and £10 respectively (per one-way trip for both improvements, 2005 prices).

Trip frequency models were also estimated to reflect changes in total travel demand as a result of changes in ferry services. The models showed, for example, that improved ferry services could lead to an increase of 55 percent in trips by day-trip visitors whereas there would be a 19 percent fall in the same segment of travellers if the ferry service were to be withdrawn. Subsequent model runs, under a few simple scenarios, provided further evidence that there would be a small drop in total passenger demand if the ferry service were to be discontinued, but a large shift to ferry from airplane and helicopter services if the ferry services were to be improved.

6.7 Summary

Discrete choice models demonstrate that it is possible to obtain and quantify the views and preferences of citizens or businesses as consumers or users of infrastructure. In the case studies presented, it was possible to monetise the preferences, generating evidence to support investment decisions.

Discrete choice modelling can also shed light on where policy and individual choices differ, thus it can help policy makers and those deploying policy measures to take informed, evidence-based decisions as to whether the cost of contravening or ignoring the difference in choices outweighs the benefit of implementing the policy measure. It also helps in identifying areas where policy measures might be adjusted to take better account of preferences without losing any of the gains of the proposed policy.

Finally, discrete choice modelling brings objectivity into charged debates, particularly when policy discussions turn to talk of "finding the right balance" between public preference and policy targets.

CHAPTER 7
Economic evaluation *Annalijn Conklin*

7.1 Key points

- Economic evaluation is a way of comparing the costs and consequences of a policy, action or intervention.
- Economic evaluation helps decision makers to choose between competing actions when resources are finite.
- Economic evaluation assesses both allocative and technical efficiency.

7.2 Defining economic evaluation

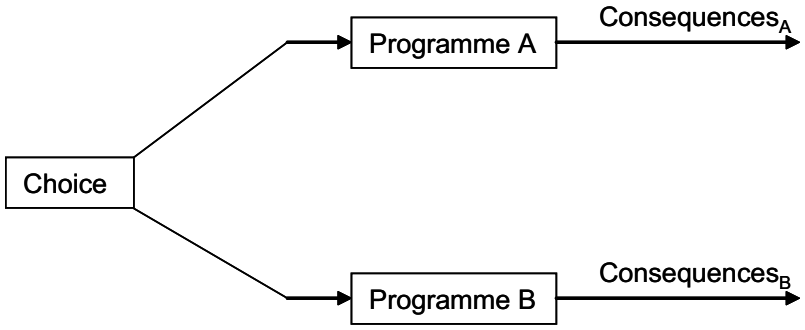
Economic evaluation is a comparative analysis that examines *both* the costs (inputs) and consequences (outputs) of two or more policies/actions/interventions. Economic evaluation studies therefore provide a structured and systematic way of helping decision makers to choose between competing or alternative ways of utilising finite resources.

The methodology has a history of being applied in the transportation sector (eg US highway and motorway development, major transport investment in Canada, UK's London Underground Victoria Line), engineering (eg US federal waterways infrastructure), education and other public sectors. In the early 1990s, the US Department of Health and Human Services issued its CBA guidebook (see reference list below). Here, we focus on the health sector because economic evaluation is especially applicable here, given that health is generally a significant public sector budget and that decisions about resource allocation based on this methodology carry a high impact on individuals and society at large.

In public health, the comparator of a particular health policy or health intervention is often "standard care" for that region or country, which can mean no programme or intervention.

There are two distinguishing features of economic evaluation studies: (1) they deal

Figure 7.1: Illustration of economic evaluation as a comparative analysis of alternative courses of action



Source: Drummond et al. (2005)

with comparing costs and consequences, and (2) they concern themselves with choices. The latter distinguishes economic evaluations from economics. Whereas the discipline of economics tries to explain the choices and behaviours of individuals and organisations, economic evaluation studies seek to inform choices that must be made by policymakers or other decisionmakers.[1]

Ultimately, the purpose of economic evaluation studies is twofold: first, to assess whether the benefits from the policies under consideration are greater than the opportunity cost of those policies (compared to alternative uses of the resources); and second, to assess whether efficiency is achieved, in terms of both allocative and technical efficiency.

7.2.1 Different types of economic evaluation

There are several different types of economic evaluation. Cost effectiveness analysis (CEA), cost benefit and cost utility are defined as "full" economic evaluation studies (Drummond et al., 2005)[2]. Other, more common, types of economic evaluations, such as cost consequence evaluation, are not described as "full" because useful cost data is often lacking or insufficient. What distinguishes the three types of full economic evaluations is the way the consequences of respective policies are expressed (see Table 7.1: Types of economic evaluation studies).

Table 7.1: Types of economic evaluation studies

Types of analysis	Outcomes/Consequences
Cost effectiveness (CEA)	Single effect of interest, common to both alternatives but achieved to different degrees Natural units (eg life years gained/ saved, cases prevented, disability-days saved, etc) Single dimension outcome
Cost utility (CUA)	Single or multiple effects, not necessarily common to both Healthy years (eg QALYs and DALYs) Multi-dimension outcomes
Cost benefit (CBA)	Monetary €, £, etc

Source: Adapted from Drummond et al. (2005)

7.2.2 Cost-effectiveness analysis

Cost-effectiveness analysis (CEA) compares the outcomes/ results between alternative policies/actions/interventions that affect the same outcome. Thus, CEA estimates expected costs and outcomes of policies and expresses the outcomes in a single dimension measure (ie natural effectiveness units). The outcomes in CEA could be intermediate or final, but they are nevertheless single, policy- or programme-specific and unvalued. In the case of health, for example, intermediate outcomes may be symptoms or risky behaviours, whereas final outcomes may be cases or deaths. Ultimately, this method produces a summary measure, a cost-effectiveness ratio, for a particular policy/action/intervention in the form of cost per outcome achieved (eg cost per cases prevented, cost per death avoided, cost per quitter, cost per abstinent, etc).

1 Policymakers' choices can also be informed by economics.

2 A partial economic evaluation is one where only one of the two distinguishing characteristics of economic evaluation is achieved. For example, a cost analysis is a comparison of two or more alternatives but examines only the costs of the alternatives and not the benefits. A cost-outcome description is a partial evaluation whereby both costs and consequences are examined but there is no comparison of two or more alternatives. For further information, see Drummond et al., 2005.

A CEA is used primarily to identify the strategy, or policy, under a fixed budget, that will achieve the maximum possible gains (or other defined objective). In other words, CEA can help determine which policies are not worth their costs. Hence, CEA assessments of whether a programme (or policy, or action, etc) is worthwhile have to be made by reference to an external standard (eg a budget constraint or threshold cost-effectiveness ratio). Furthermore, decisions on the expansion of the fixed budget require consideration of the opportunity cost that is likely to fall outside the relevant sector.

7.2.3 Cost-utility analysis

Cost-utility analysis (CUA) serves a similar purpose to CEA (and is sometimes subsumed under the same heading) in that it compares costs and benefits of alternative policies (or interventions, etc) to help decisionmakers determine the worth of a policy or programme by reference to an external standard (usually a fixed budget). In other words, both CEA and CUA are techniques that relate to constrained maximisation. However, CUA differs from CEA on the outcomes side to the degree that outcomes in CUA may be single or multiple, are generic (as opposed to policy- or programme-specific) and incorporate the notion of value. Hence, CUA is more useful to decisionmakers with a broad mandate than CEA because CUA has broad applicability.

Furthermore, CUA is viewed as a particularly useful technique because it allows for quality of life adjustments to a given set of outcomes, while concomitantly providing a generic outcome measure for comparison of costs and outcomes in the alternatives examined. In other words, CUA produces an integrated single measure, quality-adjusted life-years (QALYs), that accommodates the variation in preferences individuals or society may have for a particular set of outcomes by capturing gains from reduced morbidity (quality gains) and reduced mortality (quantity gains). The result of CUA is typically expressed in terms of the cost per QALY gained by undertaking one policy or programme over another.

In contrast to cost-benefit analysis, CUA and CEA both implicitly assume that one of the programme or policy alternatives will be undertaken regardless of its net benefit. Hence, CEA may lead to a decision to undertake a programme/intervention/policy that does not pay for itself because the technique assumes that the output (in terms of health effects) is worth having and the only question is to determine the most cost-effective way to achieve it (Drummond et al., 2005).

7.2.4 Cost-benefit analysis

Cost-benefit analysis (CBA) is often the most useful for decisionmakers; however, it is also the most difficult type of economic evaluation to conduct. This is because it compares the expected costs and benefits of two (or more) alternative policies/actions/interventions where all items are expressed and valued in monetary terms. The difficulty lies in the fact that measuring costs or benefits and valuing them in a currency requires many different skills and associated professionals. A basic tenet of CBA, grounded in welfare economic theory, is that individual consumers are deemed to be the relevant source of monetary values for programme outcomes. A CBA can therefore provide a list of all costs and benefits for each policy option over time.

In theory, CBA provides information on the absolute benefit of a policy, or programme, in addition to information on its relative performance. The results of CBA can be stated either in the form of a ratio of costs to benefits, or as a simple sum (possibly negative) representing the net benefit (loss) of one policy or

programme over another. Thus, a CBA can help achieve estimates of the Net Social Benefit, providing a *single Net Benefit (NB) value* (benefits minus costs). That is, CBA provides an estimate of the value of resources used up by each policy or programme compared to the value of resources the programme might save or create. Notably, as Drummond et al. (2005) remark, few published CBAs achieve this wider remit.

CBA can support a decision to implement a specific policy, action or programme. Such a conclusion is possible because CBA can achieve two goals. First, CBA can assess whether a programme is worthwhile, without reference to an external standard. If the Net Benefit is greater than zero, then the decision is to implement. When a choice must be made among competing options, then CBA can be used to decide to implement the programme (or policy, etc) having the highest Net Benefit. Second, CBA can assess whether the budget should be expanded to accommodate the new policy, programme or action.

7.2.5 Distinguishing types of costs and benefits

The existing literature on economic evaluation in healthcare, for example, classifies costs and benefits as *direct*, *indirect*, or *intangible*. However, the use of these terms is often not consistent across studies, which sometimes creates confusion.

In addition, the relevant costs and consequences that serve as the building blocks for economic evaluation are assembled in different ways depending upon the perspective the analyst takes regarding the role of economic evaluation. For example, a welfarist approach to economic evaluation might involve a societal perspective; an extra-welfarist approach might involve only a healthcare system perspective; and a decisionmaking approach might entail a distributional perspective. Nevertheless, we describe each of these categories of costs and benefits in turn, as summarised in Drummond et al. (2005).

- Direct costs and benefits denote the resources consumed (costs) or saved (benefits) by a programme/intervention/policy. In healthcare, these would be resources in the healthcare sector, but sometimes would include a patient's out-of-pocket expenses and resources from other statutory agencies or voluntary bodies.
- Indirect costs and benefits denote the time of patients (and/or their families) consumed or freed by the programme/action/intervention. Generally, the focus of indirect costs and benefits has been on work time, and made synonymous with productivity gains and losses. Notably, the term indirect costs can cause confusion as it is used by the accountancy profession to indicate overhead costs.
- Finally, the terms intangible costs and benefits have been used to include those consequences that are difficult to measure and value, such as the value of improved life per se, or the pain and suffering associated with medical treatment, or the increased opportunity for social participation and social cohesion, etc. Yet the latter are not costs as they do not represent resources denied to other users. Nor are these items strictly intangible, since they are often measured and valued through methods such as the utility or willingness-to-pay approach.

7.3 When to use economic evaluation

7.3.1 Cost-effectiveness analysis

Cost-effectiveness analyses are used when costs are related to a single, common effect that may differ in magnitude between the alternatives. For example, if our policy interest concerns the prolongation of life after renal failure and we are interested in comparing the costs and consequences of hospital dialysis with kidney transplantation, then the outcome of interest is common to both programmes: namely, life-years gained. However, the two programmes to prolong life have differential success in achieving this same outcome as well as differential costs. In comparing these alternatives, we would normally calculate the prolongation and compare cost per unit of effect (ie cost per life-year gained). Notably, we would only lean towards the least-cost programme if it also resulted in a greater prolongation of life, although this may not necessarily be the case.

It important to note that CEA can be performed on any alternatives that have a common effect, for example kidney transplantation can be compared to mandatory bike helmet legislation, if the common effect of interest is life-years saved and these are independent programmes. That is to say, the costs and health effects (or other benefits) in one group are not affected by the intervention alternative in any other group.

In general, CEA is most useful in situations where a decisionmaker, operating within a given budget, is considering a limited range of options within a given field.

7.3.2 Cost-utility analysis

Cost-utility analysis is most appropriate when costs are related to alternative policies that have multiple dimensions and outcomes and where quality of life is either the most important outcome or an important outcome among others (eg survival). For example, quality of life is the most important outcome of arthritis treatment, whereas both survival and the quality of that survival are important outcomes of neonatal intensive care for very low-birthweight babies. CUA should also be used when the alternatives examined affect both quality and quantity of life and a decisionmaker wishes to construct a common unit of outcome that combines both effects. For example, medical treatments for certain cancers improve longevity and long-term quality of life but decrease quality of life during the treatment process itself.

Similar to CEA, CUA is also useful when (1) a decisionmaker, given a limited budget, must determine which policies, services or programmes to reduce or eliminate to free up funding for a new policy or programme; or (2) the objective is to allocate limited resources optimally by considering all alternatives and using constrained optimisation to maximise the benefits achieved.

7.3.3 Cost-benefit analysis

Cost-benefit analysis is best used when the goal is to identify whether the benefits of a programme or policy exceed its costs in monetary value. Since CBA converts all costs and benefits to money, the advantage of CBA over CEA or CUA lies in the ability to make decisions about a policy or a programme in stages (rather than comparing two alternatives simultaneously) and with or without the constraints of a fixed budget.

Put differently, CBA is much broader in scope than either CEA or CUA insofar as the technique is not restricted to comparing programmes within a particular sector, such as healthcare, but can be used to inform resource allocation decisions both within and between sectors of the economy. As the most widely

used economic evaluation, CBA has a long history in public sector economic evaluation areas such as transport and the environment (Sugden and Williams, 1979, referenced in Drummond et al., 2005).

7.4 When not to use it

There are a number of limitations and caveats to using economic evaluation. Whilst a detailed review of these lies outside the scope of this chapter, a few key points are outlined below.

CEA/CUA should *not* be used if:

- data on all alternatives are incomplete and/or non-comparable
- there is no formal periodic budget allocation process during which all alternatives can be assessed simultaneously
- there is a need to know whether a particular goal of a programme or policy is worth achieving given the social opportunity costs of all the resources consumed in its implementation (assuming the social costs are also known)
- there is a need to capture effects that spill over to other persons (positive or negative), known as externalities in economics (eg health effects of air pollution such as chronic obstructive pulmonary disease, or asthma).

CBA should *not* be used if:

- there is a need to know only the price of achieving a particular goal or outcome, whether it is the incremental cost of a life-year saved, a case of disease detected, or a QALY gained
- decisions on allocative efficiency are not required, rather it is assumed that a particular policy or programme will be implemented
- the client focus of the expected outcome is narrow
- assigning monetary values to outcomes is neither appropriate nor possible.

7.5 Conducting economic evaluation - be wary of ratios!

It is difficult to outline one standard form of economic evaluation for several reasons. First, there are different perspectives on the role of economic evaluation (ie welfarist versus extra-welfarist versus decisionmaker). Second, measurement difficulties may compromise any analytic approach. And third, the institutional context may influence how the various "building blocks" are assembled (eg a welfarist approach may not capture all the benefits of a policy in the estimation of willingness-to-pay (WTP) if in a setting where healthcare, for example, is provided free at the point of service). Against this background, Box 7.1 shows how the same economic evaluation technique can produce different ratios based on what goes into the numerator and denominator.

Box 7.1: The same economic evaluation technique can produce different ratios

Suppose a healthcare programme had costs and consequences as follows:

Costs	*Consequences*
C_1 healthcare costs $1,000,000	health improvement
C_2 costs in other sectors $50,000	U (in preference scores) 10 QALYs
C_3 patient/family resources $5,000	W (willingness-to-pay) $2,000,000
C_4 lost productivity $100,000	S_1 healthcare savings $25,000
	S_2 savings in other sectors $20,000
	S_3 savings in personal resources $12,000
	S_4 savings in productivity $100,000
	V (other value created) $0

The following ratios could be calculated:

1. *Cost-utility ratio (healthcare resources only)*

$$\mathbf{(C_1 - S_1) / U = \$75{,}000 \text{ per QALY}}$$

2. *Cost-utility ratio all resources used)*

$$\mathbf{(C_1 + C_2 + C_3 + C_4 - S_1 - S_2 - S_3 - S_4)} / U = \mathbf{\$77{,}300 \text{ per QALY}}$$

3. *Benefit-cost ratio (including all consequences in the numerator as benefits)*

$$\mathbf{[(W + S_1 + S_2 + S_3 + S_4) / (C_1 + C_2 + C_3 + C_4)] = 2.163}$$

4. *Benefit-cost ratio (treating resource savings as cost-offsets deducted from the denominator)*

$$\mathbf{[W / (C_1 + C_2 + C_3 + C_4 - S_1 - S_2 - S_3 - S_4)] = 2.587}$$

Source: Drummond et al. (2005), p. 22

Although there is no standard "recipe" for the different types of economic evaluations, as each analysis will be different and will depend on careful consideration of all the components, it is still helpful to have a standard *sequence of steps* to follow. We therefore provide a brief synopsis of the standard steps of a cost-benefit model that are recognised as best practice, according to the Canadian Treasury Board in its 1976 *Benefit-Cost Analysis Guide* (Watson, 2005).

1. **"Examine needs, consider constraints, and formulate objectives and targets" (Watson, 2005)**. It is important that all economic evaluations clearly indicate the perspective from which costs and benefits will be assessed.
   - Each analysis must take a single point of view and it must be stated clearly at the outset. If there is a single decisionmaker, then an analysis from one perspective is often adequate. If the interests of more than one person or group are affected, then several analyses may be necessary.
   - The perspective of the analysis is critical not only for identifying costs and benefits correctly but also for choosing consistent parameters. For example, the appropriate discount rate depends upon what perspective is being taken in the analysis.
   - Maintaining a consistent point of view helps to avoid double counting the set of costs and benefits being examined.

2. **"Define options in a way that enables the analyst to compare them fairly" (Watson, 2005)**. When an option is assessed against a baseline case, then it is important to ensure that the baseline case has been optimised. (NOTE: this step is particularly relevant to CEA and CUA, which are inherently comparative.)
   - For all public investments, a full set of the most promising options should be examined.
   - When a single proposal (policy or programme) is being considered, it must be compared with a baseline case and the baseline case must be optimised.
   - The option to delay a project or policy or programme to wait for better information, or for better starting conditions, can have considerable value.
   - The only way to ensure that the options whose present values are being compared are really fair alternatives is to standardise them for time, for scale and for already-owned components. A fair options diagram can clarify a complex set of investment options.

3. **"Analyse incremental effects and gather data about costs and benefits" (Watson, 2005)**. It is helpful to specify all of the costs and benefits over time in a spreadsheet.
   - Be careful about what you count; incrementality, transfers, opportunity cost and residual value in particular are important concepts in CBA, Only incremental benefits and costs caused by the policy/action/intervention should be compared, not those that are merely associated with the input in some way. For example, if conducting a CBA of a government grant programme to encourage exporters, one would need to know not just the export sales made, but specifically the sales that were made

that would not have been made in the absence of the programme.

4. **"Express the cost and benefit data in a valid standard monetary unit of measurement" (Watson, 2005).** This step involves converting nominal dollars, pounds, Euros, etc to a constant currency, so that the CBA uses accurate, undistorted prices.
   - Once the relevant range of costs is identified, each item must be measured (ie quantities of resource use) and valued (ie unit costs or prices). It is important to recognise here that there are various definitions of cost (total, fixed, variable, cost function, average, marginal, incremental, etc). Moreover, each type of costing will have a spectrum of precision from least precise (eg average per diem) to most precise (eg micro-costing). These issues are explored further in Drummond et al. (2005).
   - In CBA, market prices are often considered as being good measures of the costs and benefits of an investment.
   - When market prices are distorted, or do not exist, the main methods for estimating the value of costs and benefits are based on shadow prices, human capital method, revealed preferences, or stated preferences of willingness-to-pay (WTP). Examples of difficult-to-estimate values are: the value of travel time savings; the value of health and safety; the value of the environment; the value of jobs created; the value of foreign exchange; the residual value of special-use facilities; and heritage values.
   - There are a number of procedures for estimating costs in the healthcare setting when existing market prices need to be adjusted, for example: (a) hospital charges; (b) hospital charges converted to costs by use of hospital-level cost-to-charge ratios; (c) hospital charges converted to costs by use of department-level cost-to-charge ratios; and (d) itemised laboratory costs with non-procedural hospital costs generated from department-level cost-to-charge ratios.
   - For health benefits, for example, there are at least three ways in which the value of goods or services can be defined: (a) find the WTP for a certain health outcome; (b) find the WTP for a treatment with uncertain health outcomes (this takes an ex-post perspective); (c) find the WTP for access to a treatment programme where future use and treatment outcomes are both uncertain (this takes an ex-ante perspective).
   - Income multipliers should generally be avoided but, when used, must be applied even-handedly to costs as well as benefits.
   - The literature can sometimes provide approximate values for difficult-to-measure items (eg clean and natural environment, time savings for commuters, jobs created). Standard government parameters and benchmarks should be used whenever possible.

5. **"Run the deterministic model" (Watson, 2005)** (using single-value costs and benefits as though the values were certain).

6. **"Conduct a sensitivity analysis to determine which variables appear to have the most influence on the Net Present Value (NPV)" (Watson, 2005).** This step involves considering whether better information about the values of these variables could be obtained to limit the uncertainty, or whether action can limit the uncertainty (eg negotiating a labour rate). A key question to ask here is: "Would the cost of this improvement be low enough to make its acquisition worthwhile?" If the answer is yes, then the response is to act.
   - The outcome of CBA is typically influenced by several uncertain factors, and this is true across fields as diverse as health, education, employment, and economic development. It is therefore important to know how sensitive the outcome is to changes in those uncertain factors.
   - Sensitivity analysis, however, only treats variables one at a time, holding all else constant. Thus, simultaneous actions and interactions among variables in the real world are ignored because sensitivity cannot deal with more than two variables.
   - Four factors contribute to sensitivity: the responsiveness of the NPV to changes in the variable; the magnitude of the variable's range of plausible values; the volatility of the value of the variable; and the degree to which the range or volatility of the value of the variable can be controlled.

7. **"Analyse risk (which arises from uncertainty in the data) by using what is known about the ranges and probabilities of the costs and benefits values and by simulating expected outcomes of the investment" (Watson, 2005)**. What is the expected NPV? Apply the standard decision rules.

8. **"Identify the option which gives the desirable distribution of income" (Watson, 2005)** along a chosen dimension such as income, class, gender, region, etc – whatever categorisation is deemed to be appropriate.
   - Questions of fairness are difficult in CBA because it generally assumes that everyone in the reference group takes the same point of view, which is reasonable when there is a single investor but not when the perspective is society at large.
   - Many governments, including the Government of Canada, have fairness objectives as well as efficiency objectives, which often clash, and there are no non-contentious ways of combining efficiency and equity objectives in the same set of figures.
   - Distributional issues should be covered in every CBA but kept separate from the economic efficiency analysis. If a recommendation to approve a particular alternative hinges on equity objectives, then the net cost of choosing the equity-based recommendation must be made visible to decisionmakers.
   - There is no clear and simple way to adjust CBA calculations to take fairness into account, and several different approaches are possible: (a) ignore distributional issues; (b) use distributional weights; (c) focus on basic needs; or (d) focus on visibility and transparency. However, even a simple analysis showing who benefits

and who pays can be often helpful to decisionmakers.

9. **"Considering all of the quantitative analysis, as well as the qualitative analysis of factors that cannot be expressed in dollars, make a reasoned recommendation" (Watson, 2005)**.
    - In performing a CBA, there are five key components of this framework that are general to all public investment decisions and considered to be best practice (Watson, 2005). These include the following: (1) a parameter table; (2) an operations/ incremental effects model; (3) a table of costs and benefits over time; (4) a table of possible investment results (NPVs); and (5) a statistical and graphical analysis of investment risk and expected NPV.

Finally, it is important to remember that all economic evaluation studies are no better than the underlying data provided or collected for the analysis. There are a number of differences between typical business or financial data and data used in a CBA. In CBA, every cost and benefit is fully recognised at the time it occurs (not accrued beforehand), timing is dealt with through discounting (consistent with the point of view taken) and changes in the values of assets are dealt with by including residual values at the investment horizon. In other words, CBA does not use accruals, depreciation allowances or other "non-cash" items (Watson, 2005).

7.6 Summary

Economic evaluation takes a number of different forms, depending on the extent of monetisation of both costs and benefits to be analysed and/or compared. It is important to remember that, while a CBA can be distinguished from a CEA by the fact that CBA attempts to go as far as possible in quantifying benefits and costs in monetary terms, the ideal of measuring all benefits and costs in monetary terms is rarely achieved in practice. The distinction is therefore merely a difference in degree and not in kind, as Drummond et al. (2005) note.

Similarly, there are a number of different costs and benefits to be distinguished and the perspective from which the analysis should be undertaken must be stated clearly at the outset of the analysis, as this will determine what costs and benefits are included in the economic evaluation.

Each type of economic evaluation has a different purpose and this will determine the conditions under which it is used. Given the different economic perspectives that can be taken (eg welfarist, extra-welfarist, etc), there is no single way to conduct an economic evaluation; however, a standard sequence of steps provides a useful guide.

7.7 Further reading on economic evaluation

Table 7.2: Four health-related economic evaluation databases

Name	Web link for information source of database searches
HEED*	http://www3.interscience.wiley.com/cgi-bin/mrwhome/114130635/HOME
Tufts CEAR	http://www.cearegistry.org
EuronHEED	http://infodoc.inserm.fr/euronheed/Publication.nsf
York CRD	http://www.york.ac.uk/inst/crd/crddatabases.htm

*Access to HEED is by private subscription of RAND Europe.

Commerce Commission of New Zealand, *Guidelines to the analysis of public benefits and detriments*, Auckland, New Zealand, December 1997

Drummond, M.F. and A. McGuire, eds., *Economic Evaluation in Health Care: Merging Theory with Practice*, Oxford, England: Oxford University Press, 2001.

FSA, *Practical Cost-Benefit Analysis for Financial Regulators Version 1.1*, London, June 2000.

Gold, M.R., J.E. Siegel, L.B. Russell and M.C. Weinstein, eds., *Cost-effectiveness in Health and Medicine*, New York: Oxford University Press, 1996.

International Committee of Medical Journal Editors, "Uniform requirements for manuscripts submitted to biomedical journals", *Annals of Internal Medicine*, Vol. 126, 1997, pp. 36-37.

Johannesson, M., *Theory and Methods of Economic Evaluation in Health Care*, Dordrecht, Germany: Kluwer, 1996.

Levin, H.M. and P.J. McEwan, eds., *Cost-effectiveness Analysis: Methods and Applications, 2nd ed.*, Thousand Oaks, CA: Sage Publications, 2000.

Neumann, P.J., *Using Cost-effectiveness Analysis in Health Care*, New York: Oxford University Press, 2005.

Nera Economic Consulting, *The FSA's Methodology for Cost-benefit Analysis*, New York: Marsh and McLennan Companies, 26 November 2004.

Sloan, F., ed., *Valuing Health Care*, New York: Cambridge University Press, 1995.

US Department of Health and Human Services, *Feasibility, Alternatives, and Cost/Benefit Analysis Guide*, Washington, DC, July 1993.

World Bank, *Monitoring and Evaluation: Some Tools, Methods and Approaches*, Washington, DC, 2002.

CHAPTER 8
Focus group interviews *Aasha Joshi*

8.1 Key points

- Focus group interviews provide insight into a variety of norms, attitudes, and practices across a range of stakeholders.
- Focus groups enable programme implementation, perceived utility and efficacy to be documented.
- Focus groups rely on carefully structured questions and skilled moderators.

8.2 Defining focus group interviews

A focus group interview is a group interview conducted with 6–10 participants guided by a moderator, who facilitates the discussion among the participants.

However, "although group interviews are often used simply as a quick and convenient way to collect data from several people simultaneously, focus groups explicitly use group interaction as part of the method" (Kitzinger, 1995, p. 299). In comparison to individual interviews, focus groups and the interactions they evoke can generate a wide range of opinions and ideas, with each idea and opinion prompting others among the focus group participants (Zikmund, 1997). The value of the method "lies in the unexpected findings that emerge" from the participants, their unanticipated ideas, suggestions, and responses (Malhotra and Birks, 2000, p. 161).

Focus groups are useful to aid understanding the particular contexts in which programmes are being or will be implemented. In conducting a focus group, auditors can learn about programme implementers' (ie, service providers') general thoughts, perspectives, and experiences about a programme. In turn, potential or existing strengths and weaknesses of an exiting or proposed programme can be diagnosed, according to the expressed needs of programme implementers. Focus groups can grant insight into a variety of norms, attitudes and practices among a range of audit topics, including management processes, information systems and accountability relationships, from a number of different programme participants within a single timeframe.

8.3 When to use focus groups

Focus groups are most useful as a data collection method when the audit objective includes the following:

- exploring, piloting, or refining a programme concept
- identifying and understanding participants' goals, expectations, and views of the efficacy of an established or proposed programme
- documenting experiences in implementing a programme
- describing differing outcomes across people or sites.

Similar to interviews with key informants, focus groups are not as useful as a stand-alone method when the primary research objective is to measure outcomes across an entire setting or programme or to determine the cause of effects of an implemented programme.

8.4 Conducting focus group interviews

The purpose of the audit should guide the process of selecting focus group participants. Participants should be selected in terms of how they are related to the implementation of the

programme in question. For example, if the auditors are interested in exploring the reporting procedures of management to external bodies, then it may prove useful to not only recruit the managers who are involved in the process of reporting itself, but also those who are behind the scenes yet integral to the reporting process (eg contracts, public relations, or administrative personnel). Note, however, that this would entail conducting at least two different focus groups. When determining the composition of the focus group, homogeneity within each group is fundamental. People of differing authority, job classification, or level of education should not be combined, as this may detract from any common ground presupposed in the questioning.

At a minimum, focus group participants should not be selected on the basis of an existing group (eg people who all work together or friends), unless such a selection is the target audience of the programme. A group with members who are already acquainted removes anonymity and encourages endorsement of each other's views (Stewart and Shamdasani, 1990), all of which work to bias the potential findings from the focus group. "It must be remembered, however that a small discussion group will rarely be a representative sample, no matter how carefully it is recruited." (Zikmund, 1997, p. 110). In turn, findings are not necessarily generalisable to the target population relevant to the audit. Instead, the focus group provides fodder for identifying focus group participants' experiences and possibilities for further programme development.

If the auditors decide not to hire an external moderator to run the focus group, then they should select a moderator who is not associated with the programme for which the group is being conducted. A moderator internal to the programme may affect the ways in which participants respond to the questions. The moderator focuses the kinds of questions asked of the group, and creates a relaxed environment in which participants actively engage in the discussion.

Inherent to a focus group is a semi-structured format, relying on open-ended questioning. A set of initial questions or topics to be addressed should be pre-determined before the focus group, and the questions asked should move from the general to the specific (Stewart and Shamdasani, 1990). Prior to asking the questions, though, the focus group participants should be welcomed and, as in key informant interviews, should be offered an explanatory framework that will position the purpose of the focus group. The ground rules for the focus group should be described, including assuring the participants that the information gathered will be confidential and that everyone's views are important. Participants should be reminded that the moderator wants to hear clearly what each person is saying and that only one person should speak at a time.

The format of a focus group, as described by Krueger in the book *Focus Groups: A Practical Guide for Applied Research* (1988), follows a pattern of five types of questions, which include the following:

- opening questions, which are brief, factual, and establish common ground among the participants
- introductory questions, which introduce the general purpose of the interview and serve to start conversation and interaction
- transition questions, which narrow the scope of the topics of interest and allow participants to hear others' viewpoints
- key questions, which are directly linked to the audit's research question and will be the basis of analysis
- ending questions, which close the interview, highlighting the most salient points from responses.

Suppose, for example, that a department within an organisation wants to revamp its employee review process, in which employees currently meet with their supervisors once a year for a performance review. The organisation wants to identify what aspects of the review process are relevant to work quality. Using Krueger's framework, possible questions for a focus group with current employees in the department might include those shown in Table 8.1.

Table 8.1: Five types of questions and examples

Question Type	Example
Opening question	Tell us your name and how long you have been with the company.
Introductory question	How are you currently given feedback about your work?
Transition question	How do you feel about this?
Key question	How would you characterise helpful feedback from your supervisor?
Key question	How would you characterise helpful feedback from your co-workers?
Key question	How are these kinds of feedback reflected in your annual review?
Key question	What affect does the current structured review process have on how you do your job?
Key question	What affect does the current structured review process have on your professional development?
Key question	Which features of the review process are particularly useful to you?
Key question	Which features of the review process are particularly unhelpful to you?
Ending question	Suppose you were in charge, what changes would you make to the current review process?
Ending question	[Offer a brief summary of the key questions.] Is this summary accurate?
Ending question	The goal of this focus group was to explore what you think about the employee review process. Have we missed anything?

Notice that none of these example questions asks "Why?" Questions beginning with "Why" may make participants feel that they are required to justify, on the spot, their views or behaviours, making them defensive to further prompts. Instead, questions should focus on attributes (ie, characteristics and features of the programme or practice), as well as influences (ie, the impetus of a practice or programme). For example, instead of asking participants "Why is the review process unhelpful to you?" the moderator can ask "What features of the review process are unhelpful to you?" or "How does the review process inhibit your work?". Although the difference appears small, the "What?" and "How?" questions help set the participants at ease (Krueger, 1998). In general, focus group questions should be clear (ie, jargon free and worded in such a way that they will not be interpreted in different ways by the different participants), unbiased (ie, not favour one particular kind of response over another),

and presented in the context of the purpose of the audit.

Focus group moderators, like interviewers of key informants (referred to elsewhere in this handbook), need to respond, probe, and follow up to gain explicit understanding of the participants' responses. The moderator should take care not to bias the participants' responses by only responding to or probing favourable or unfavourable comments. To encourage discussion among the participants and determine the pervasiveness of a particular view, when the moderator asks follow-up questions they should ensure that others in the group are asked if they have similar or different experiences, irrespective of whether the experience is positive or negative.

Due to the generative nature of focus groups, they can be difficult to moderate at times. It is crucial that the moderator includes everyone in the discussion, without letting any one person co-opt the session. Krueger (1998) describes the various kinds of challenging focus group participants, which include dominant talkers, reluctant contributors, ramblers, and self-appointed experts, as well as strategies to deal with each. A focus group moderator needs to be able to "encourage and stimulate" the flow of purposive discussion from all participants without being intrusive (Malhotra and Birks, 2000, p. 163). As with interviewers of key informants, a good moderator will be a keen and disciplined listener, able to keep participants' responses on topic without curtailing their contributions.

A notetaker should be present during the focus group interview to record the participants' responses, by taking detailed notes and preferably audio-taping the discussion as well. After the focus group, notes should be written up, noting the questions answered and the topics discussed. Each of the participants' responses should be noted, including who did not respond to particular questions, keeping as much to the participants' own words as possible.

The focus group notes or resulting transcripts will be analysed so that conclusions about the programme in question can be drawn. When writing a report of the responses from the focus group, be sure to"identify agreements (group consensus) and dissenting views" across groups and "discuss similarities and differences by groups and by individuals" (Planning and Evaluation Service, 2005). Ultimately, the report should present findings, as well as explicitly state how the findings relate to the audit's research questions. How the specific analysis should be used will be determined by the purpose of the focus group itself. Findings can be used as the developmental framework for additional data collection (eg, surveys) or they can be used as contained descriptions of people's responses to the audited programme.

8.5 Focus groups in action

RAND Europe conducted focus groups in a study on remuneration and pay in the UK armed forces. The aim of the focus groups was to determine the importance of pay in decisions to leave the armed forces. These focus groups tried to outline a range of factors that would influence such career choices as well as capturing the background and personal circumstances of the individual participants. The sessions focused on outlier views as well as consensus among participants. The outputs allowed the Ministry of Defence (MoD) to understand better how pay was perceived to be linked to career choices in the armed forces. The focus group moderator was given a number of prompts for areas that the MoD wanted to explore in more detail, such as child allowances and deployment awards. Questions

in the protocol for the focus group discussions included:

1. Please take a turn and tell us briefly your age, rank, and how long you've been in the service. [*Moderator and Notetaker. Record left participant as 1 and number participants clockwise.*]
2. How did you become interested in a career in the Armed Forces? *Probe to clarify the most important reasons. Prompt if necessary:*
   - a. In a previous study we were told that travel, friends and family influence, or job security were factors. Which of these were important to you, or was there another reason? [Moderator, if necessary, attempt to differentiate between childhood aspirations and the more deliberate step of considering employment.]
3. What made you finally decide to join the Armed Forces? Probe to clarify the most important reason. [*Moderator and Notetaker: In this and subsequent questions record, when appropriate, whether participants individually or collectively show concurrence I, dissension (D), or argument (A) with any noted comments.*]
4. Did you consider any of the other services? If so, which ones and why?
5. Thinking about what you were told during the application process, perhaps by recruiters, how does the reality of Service life compare? Does anything stand out as being particularly different to that which you were expecting? *Probe (if necessary):*
   a. Were you prepared for the discipline expected in basic training?
   b. Did you receive enough information about the physical demands of Service life?
6. Some of you mentioned [*FEEDBACK*] as reasons for joining. Now that you have been in for a short while, what do you see as the positive aspects to being in the Armed Forces? Are there other benefits or rewards?
7. What are the negative aspects to being in the Armed Forces?
8. What factors are influencing or will influence your decision on whether to stay in the Armed Forces? *Prompt (if necessary):*
   a. Perhaps you have always intended to leave at your first break point?
   b. Or you want reach specific professional goals that will take time?
   c. Are finances a consideration?
   d. Career options outside the military?
   e. Family issues/dependents?
9. [*Notetaker record particularly any participants who specifically mention child education allowances (possibly as CEA or BSA) and the context of their comments.*]
10. As I mentioned at the beginning, this is a review of the impact of pay and allowances. With that in mind what do you think about the levels of your current pay, future pay and your allowance package?
11. [*Preamble from SP(Pol) regarding the recent operational pay announcement – a sentence up to a short paragraph to set the scene, eg It has recently been announced that members of the Armed Forces deployed to Afghanistan and Iraq will be paid additional money.*]
12. Does this make operational deployments more attractive? How will it affect you if you are not deployed? *Probe:*
    a. Would deployment pay influence your decision to stay in the Armed Forces?
    b. Would you accept more frequent deployments so long as you received the additional deployment pay?
13. How do you think being in the Armed Forces will affect your decision to buy a home? [*Moderator: consider the oral answers to previous questions to challenge answers.*

For example, look for contradictions between intended time in service, purchase aspirations and the answers offered to this question.]
Prompt:

a. Do you think job security will help with your house purchase?
b. Would you want to live in your new home?
c. How do you think the demands of service life will affect home ownership?

14. What message would you like to convey to the leaders and policymakers in the Armed Forces?

8.6 Summary

Focus groups are far more structured and prepared than many people expect. Simply sitting down with a few people and asking for their opinions will be of little benefit to an auditor. Participants in a focus group must be carefully selected, the questions and their sequence prepared well in advance, and the moderator should be skilled at asking the right questions in the right way. Useful information is only revealed once the notes and transcripts of the focus group interviews have been analysed in detail.

CHAPTER 9
Futures research *Stijn Hoorens*

9.1 Key points

- Futures research encompasses a number of different techniques across a range of academic fields that help explore what might happen in the medium- to long-term future.
- Futures research tools range from qualitative (scenario narratives) to quantitative (regression analysis), from probabilistic (plausibility matrix) to deterministic (scenario planning), and can be expert-based, literature-based or based on stakeholder participation.
- There is limited evidence that futures methods lead to more robust strategic policy decisions. However, their merit lies in agenda-setting, and understanding uncertainty and stakeholder engagement.

9.2 Defining futures thinking

Futures thinking is generally not regarded as a discipline on its own; it is highly fragmented, covers a range of academic fields, and is practised by a myriad of academic departments, think tanks, consultancies and government institutions. Although there is no unambiguous definition, futures research can be considered a collection of approaches that are employed to conduct policy analysis for the long- to medium-term future. It is not limited to specific methods and covers a vast array of approaches. Futures research has been called a "very fuzzy multi-field" (Marien, 2002).

Whenever one is faced with a decision whose success depends on an interplay of factors beyond the control of those making the decision, future developments or events that may be uncertain must be anticipated. Essentially, every decision is affected by exogenous factors; from switching on the light (a lightning strike may cause a power outage) to the decision to build a new terminal at Heathrow Airport (the demand for commercial air travel may drop as a consequence of terrorism, recession or cheaper alternative modes).

The desire to anticipate what the future holds is not new. The Delphic oracle, established in the 8th century BC, had a prestigious and authoritative position in the Greek world, while Nostradamus, who published *Les Propheties* in 1555, has attracted an enthusiastic following who credit him with predicting many major world events.

In modern history, decision makers look to the future using methods other than mere prophecy or prediction. Analysts at the RAND Corporation pioneered the development of futures research methods to describe potential strategies that the enemy could adopt during the cold war. Prior to the 1973 oil crisis, Shell used the scenario method developed at RAND to improve its long-term strategy. Nowadays, futures research is increasingly employed by the private and public sector as part of their strategic decisionmaking process and long-term policy analysis. Box 9.1 illustrates how a number of European governments have incorporated a long-term policy perspective into their institutional structure, through the creation of cross-cutting or departmental strategic futures units.

Box 9.1: Embedding a long-tern perspective in government and administration

In *Sweden*, the government has institutionalised a set of 16 long-term objectives for the future of the country, which are monitored through a secretariat located within the Swedish Environment Protection Agency.

The *UK Foresight Programme* and the *Horizon Scanning Centre* are based in the Government Office for Science, in the Department for Innovation, Universities and Skills. The Future Analyst Network (FAN-Club) is a permanent network of people dealing with future-related issues in different departments and agencies.

In *Finland*, a national foresight reporting mechanism requires the Prime Minister's Office to produce a national foresight report at the beginning of each legislative period, which is then subject to discussion in the Committee for the Future of the Finnish Parliament.

A common approach for assessing the potential impact of certain actions in the future involves gathering evidence about the empirical effectiveness of comparable interventions in the past. For instance, Dewar (1998) attempted to understand the potential social consequences of the Internet revolution by examining the social effects of the printing press. Dewar argued that the Internet allows many-to-many communication on a global scale for the first time, and asserted that this capability is of similar magnitude to that of the printing press. Such insights from history suggest issues that may be considered to frame long-term policy for the future (Lempert et al., 2003).

There are, however, several limitations to an approach that uses historic evidence, which are listed by Van't Klooster and van Asselt (2006):

- There are limits to the extent to which empirical data about the past and present can be measured and obtained.
- The system or processes under consideration can behave in different ways as the future exhibits uncertainty and unpredictability (Bell 2000).
- Many relationships that seem to have developed in a linear way in the past may follow a non-linear pattern in the future (eg Lempert et al., 2003, Nowotny et al., 2001).
- Finally, the future is unknown, thus different and conflicting perspectives as to how the future may unfold can each be legitimate.

As a consequence of these complexities, performing futures studies is not a matter of data collection and analysis in a classical sense. Although future studies may use empirical evidence about current trends or causal mechanisms, they can be distinguished from empirical analysis in that they explore possible, probable and/or preferable future situations (Amara, 1981). The latter distinction is reflected in a common typology used for futures approaches, adapted by Börjeson et al. (2006) based on the principal question users want to pose about the future:

1. Forecasting (What will happen?): projecting effectiveness through extrapolation of empirical data combined with assumptions about future developments. This category of approaches aims to delineate probable futures.

2. Utopian approaches (What can happen?): developing plausible futures that could vary from best case scenarios to worst case scenarios and anything in between. This approach does not aim to identify future situations based on likelihood, but rather those based on plausibility.
3. Vision building (How can a specific target be reached?): developing preferable futures through identification of aspects that are desirable.

A multitude of methodological approaches is covered extensively in the academic literature, testifying to the vibrancy of the field (see, for example, Lempert, 2007, Bishop et al., 2007, Bradfield et al., 2005, Lempert et al., 2003). Other dimensions in which these techniques can be characterised include: qualitative (scenario narratives) versus quantitative (regression analysis); probabilistic (plausibility matrix) versus deterministic (scenario planning); expert-based, literature-based or approaches based on stakeholder participation. The table below provides a brief description and characterises a number of selected futures techniques.

Table 9.1: Brief descriptions of a selected sample of futures research methodologies

Technique	Description	Characterisation
Backcasting	In backcasting, process participants describe a shared vision of their preferred future and consequently delineate the measures and milestones that are needed to deliver this vision.	▪ Vision building ▪ Qualitative ▪ Deterministic ▪ Stakeholder participation
Delphi	Delphi is a consultation process involving a group of experts with ranging specialities. The experts participate anonymously in a number of sequential questionnaires about future developments. After each iteration the experts are asked to reconsider their opinion in view of the consensus and the reasons for disagreement. The two elements that mark a Delphi study are anonymity and feedback. See Chapter 5.	▪ Forecasting ▪ Qualitative ▪ Deterministic ▪ Expert-based
Gaming	Gaming involves simulation of a real-world situation by getting participants to play different roles in a controlled, risk-free environment. Gaming can be used to develop alternative perspectives of the future, or to test out alternative strategies and tactics that participants may later use.	▪ Utopian ▪ Qualitative ▪ Deterministic ▪ Stakeholder participation
Horizon scanning	An effort to delineate significant changes in the world beyond the organisation of interest. Scanning is based on a systematic review of current journals, news outlets, magazines, web sites, and other media for indications of changes likely to have future importance. Horizon scanning focuses mainly on trends rather than events.	▪ Forecasting ▪ Qualitative ▪ Deterministic ▪ Expert and literature-based
Modelling and simulation	Include a cluster of quantitative techniques that are used to test a number of hypotheses about a particular system. Models are artificial representations of a system, which may be used to understand its causal relations. When run under different assumptions, models may provide insight about potential future states of the system. Such simulations allow the operator to appreciate interdependencies and their relative weightings in a variety of conditions. Examples include discrete choice models (see Chapter 6), system dynamics models, stochastic models, econometric models (see Chapter 18).	▪ Forecasting ▪ Quantitative ▪ Deterministic or Probabilistic ▪ Data-, literature- or expert-based
Plausibility matrix	Developing a plausibility matrix requires a series of questions to highlight the extent to which participants agree about the future. It is designed to reveal differences of opinion and to highlight the strategic choices that need to be made to ensure that policies or strategies are fit for the future.	▪ Forecasting ▪ Quantitative ▪ Probabilistic ▪ Stakeholder participation

Continues

Table 9.1 (continued): Brief descriptions of a selected sample of futures research methodologies

Technique	Description	Characterisation
Roadmaps	A roadmap is a visualisation of the future (often 5 years) integrating all relevant policy and contextual aspects. A roadmap outlines the key steps and milestones to respond to a particular challenge. It outlines overall action plan and details key objectives to be met. Combining research, trends, applications, objectives and action plans, it shows the development strands of key elements, their connections with other strands and potential applications that result.	▪ Vision-building ▪ Qualitative ▪ Deterministic ▪ Stakeholder participation
Scenarios	Scenarios are systematically derived representations of plausible states of the future. They do not predict the future. Rather they provide the means to consider today's policies and decisionmaking processes in light of potential future developments that are both uncertain and important. Scenarios enable decisionmakers to identify, structure, and plan for future uncertainties, and to take decisions that are robust under different circumstances.	▪ Utopian ▪ Qualitative ▪ Deterministic ▪ Stakeholder participation
Systems maps	The objective of building a systems map is to conceptually represent a complex situation and its underlying structure through a set of variables and its interrelations. The performance of organisations and the effectiveness of policies often depend on a myriad of endogenous and exogenous factors with mutual dependencies. Representing the nature and direction of these dependencies facilitates characterisation of the potential policy levers in the system. Systems maps may summarise and communicate current developments, relationships and boundary conditions that may have an impact on future systems behaviour.	▪ Forecasting ▪ Qualitative ▪ Deterministic ▪ Literature- and expert-based
Visioning	The systematic creation of images of desirable futures for the organisation of interest. Kicking off with a review of historic and current trends, consequently envisioning desirable futures, and finishing with the identification of strategies to achieve the desired future.	▪ Vision-building ▪ Qualitative ▪ Deterministic ▪ Stakeholder participation
Trend analysis	The examination of historic performance in order to characterise possible future trends, their nature, causes, longevity, and potential impact.	▪ Forecasting ▪ Quantitative or qualitative ▪ Deterministic ▪ Data- or literature-based

9.3 When to use futures research

Since the success of virtually every decision taken depends on factors that are beyond the control of the decisiontaker, every policy development, termination or amendment could benefit from some form of futures research. However, there are situations in which these techniques are particularly pertinent:[1]

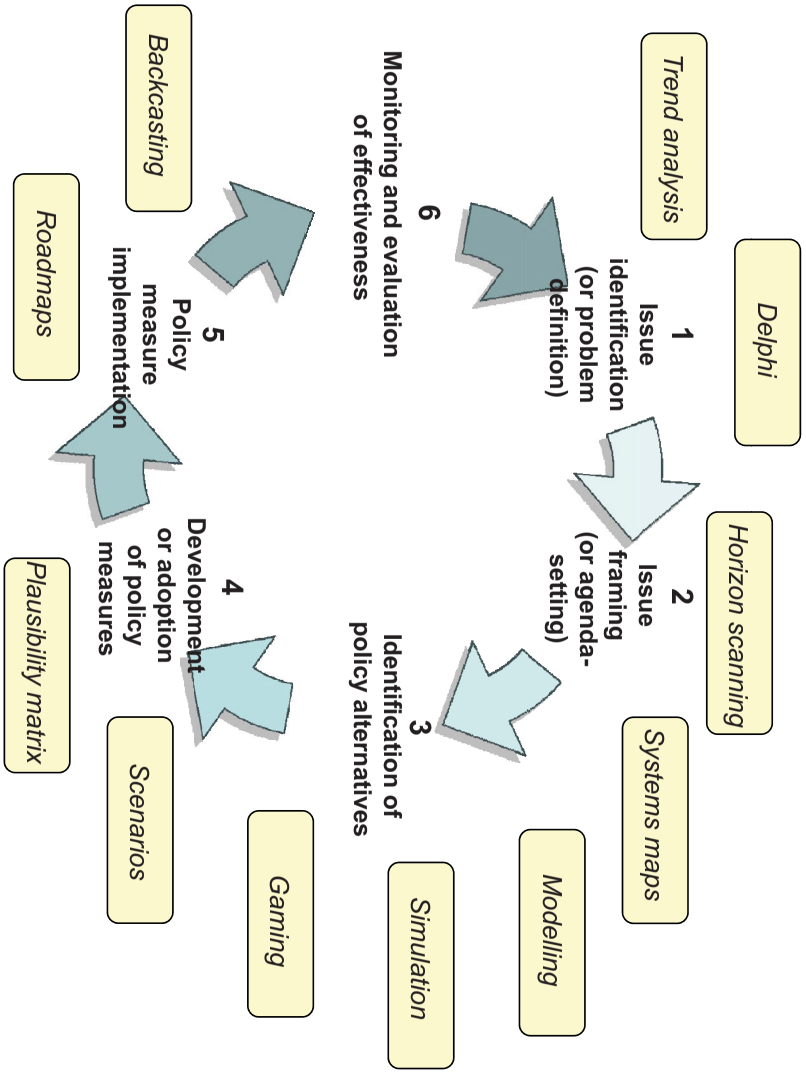
- Situations where there are substantial delays between actions and desired effects. These typically concern contexts in which the size of the required investments conflicts with shorter-term objectives. Examples of these include education policy, large infrastructure projects, or emission reduction to offset climate change.
- Sectors or policy areas undergoing substantial transformations. Examples include the financial sector, or the position of China on the world stage.
- Situations subject to significant surprises. Although it is difficult to determine which situations will be subject to significant surprises, some areas tend to be less predictable than others; for example, technology-intensive or innovation-heavy sectors such as medicine, Internet services or energy provision.
- Situations where there are institutional lock-in effects which yield a persistent gap between goals and performance. An example of such path dependency is car traffic in a large metropolis, which can be inefficient and expensive and has considerable externalities. The alternative option of introducing a more efficient urban transport system without these externalities (eg noise, emissions, congestion), however, is not attractive due to its extremely high sunk costs.
- Situations with significant interdependencies between different policy domains, including unintended side-effects, policy trade-offs and feedback loops. These policy problems are typically characterised by a large number of stakeholders with competing interests. Examples include large infrastructural projects or employment policy.
- Situations with considerable differences between individual stakeholders' interests and collective (public or national) interest. This is related to the first situation as it will often occur when an investment in future generations is required at the expense of current stakeholders. Examples include pension reform or climate change.

In the situations described above, futures research can have a number of merits, which cut across the different stages of policymaking. The concept of the "policy cycle" (see Figure 9.1) is a helpful, heuristic framework that breaks down the policymaking process into several phases (see, for example, Brewer and deLeon, 1983, May and Wildavsky, 1978, Anderson, 1975).[2] The figure below links the different futures techniques listed in Table 9.1 to the policy phase in which they are most useful.

1 Adapted from Lempert et al. (forthcoming).

2 In practice, the process of policymaking does not follow such a strict linear sequence of stages. Instead processes run in parallel, overlap, short-cut each other or are left out. However, in absence of a better conceptual framework this concept is used to illustrate the context of using scenarios in policymaking.

Figure 9.1: The relevance of futures research methods at different stages of the policy cycle



Futures research can be used to directly provide support for decisionmaking, through informing specific decisions in the policy formulation and implementation phase. It can, however, also be used for various forms of indirect decision support, such as clarifying the importance of an issue, framing a decision agenda, shaking up habitual thinking, stimulating creativity, clarifying points of agreement and disagreement, identifying and engaging participants, or providing a structure for analysing potential future decisions (see Parson et al., 2007). The various direct and indirect forms of decision support can be roughly grouped into six forms:

- stimulating wider debate about possible futures (indirect)
- getting stakeholder buy-in or engagement (indirect)
- triggering cultural change within the organisation (indirect)
- clarifying the importance of an issue and framing a decisionmaking agenda (direct)
- generating options for future action (direct)
- appraising robustness of options for future action (direct).

Futures research should be understood more from a process-oriented perspective than from a product perspective. The early phases of the policy cycle require more indirect forms of decision support, such as shaking up habitual thinking in order to come to a new understanding of problems, or clarifying points of agreements and disagreement in order to establish a policy agenda. Direct forms of policy support such as evaluating the feasibility of policy options are required in the policy measure development and implementation phases. Creating legitimacy for public action is a cross-cutting issue through all phases.

The challenge is to match not only the different knowledge and information demands at the different stages of the policy cycle, but also the different levels of stakeholder engagement that are required to ensure that the process is regarded as relevant and legitimate. Identifying key issues, framing the complexities and uncertainties around them and highlighting their policy relevance require broader thinking from different perspectives. Engaging a larger number of stakeholders creates the conditions for imaginative and coherent conversations about the future which explore alternative possibilities.

9.4 Futures research is not a panacea

Whilst there is broad consensus on the merits of futures thinking, there is little evidence of its effectiveness. Evidence is mostly anecdotal and limited to a few "classic" stories from the corporate world – such as Shell's anticipation of the 1974 oil crisis – that are often cited as proof for the effectiveness and usefulness of futures research in terms of supporting strategic decisionmaking.

While there has been little evaluative literature on futures research, studies on the impact of strategic planning on organisational performance have not delivered robust findings. Ramanujam et al. (1986) observed: "The results of this body of research are fragmented and contradictory", while Boyd (1991) concluded: "The overall effect of planning on performance is very weak."

The limited attention to effectiveness may be due to the notion that the effectiveness of futures research is not a concept that is easy to define. First, the effectiveness depends on the objectives of the study, which are often multiple, long-term and difficult to measure. Second, even for one particular futures study, different stakeholders may have different

perceptions of its objectives and therefore have different definitions of its effectiveness. But it is also difficult to define the criteria for the softer benefits of futures research: is it a success when policymakers start to think about longer-term consequences from a broader and better-informed perspective? Is it a success when scenarios help to better manage conflicts between policymakers and stakeholders? Or should scenarios directly influence the design of policies? Answers to these questions vary considerably among those from different schools of thought.

Efforts are required to better bridge long-term policy analysis in public policy and understand the factors that condition effectiveness and efficiency in terms of decision-support. This is not an easy task.

The benefits attributed to developing and using scenarios are manifold. Significant gaps seem to exist, however, between current scenario practice and the potential contributions of scenarios. It is unclear whether scenario planning is really effective in delivering a clearer path through the complexities and uncertainties of our times (Chermack, 2005). There is anecdotal evidence that many political decisionmaking processes that could benefit from these methodologies are not using them. A recent literature review (Lempert et al., 2009) shows that there is little evidence from the public sector that the many scenario studies that have been conducted have had a positive effect on the robustness of organisations' strategies or long-term decisionmaking.

9.5 Conducting futures research

As explained earlier, futures research is an umbrella term for a range of techniques used in long-term policy analysis. There is a considerable and expanding body of academic literature in this field, and there are a number of useful resources for practitioners. Perhaps the most comprehensive and practical resource is the online tool kit published by the Horizon Scanning Unit in the UK Foresight Directorate. It covers a range of futures techniques and illustrates them with case studies and good practice examples (HSC, 2008). This section briefly discusses a possible approach to one of the most common of these techniques: scenario planning.

Scenarios have been employed by many organisations, public and private, small and large, around the world. The scenario axis method elaborated by Peter Schwartz (1991) is the most commonly used futures research method in public organisations.

Scenarios are useful tools for raising awareness and shedding new light on current strategic debates. More importantly, multiple scenarios can be used to test policy options for robustness. If an option appears to be effective in several highly different scenarios, this implies that it is robust in the range of plausible futures spanned by the scenario dimensions. For options that are not robust, it is important to understand the circumstances under which they are not effective.

Each scenario is a description of one possible future state of the system, but does not give a complete description of the future system. Scenarios include only those factors that might strongly affect the outcomes of interest. Because the only certainty about a future scenario is that it will not be exactly what happens, several scenarios, spanning a range of developments, are constructed to cover a range of possible futures. No probabilities are attached to the futures represented by each of the scenarios. They have a qualitative, not a quantitative, function. Scenarios do not tell us what *will* happen in the future; rather they tell us what *can* (plausibly) happen.

Scenario thinking aims to identify new developments, risks or impacts which might

otherwise have been missed. It is a means of stimulating more informed and deeper conversations about the future direction of a certain policy area. Building scenarios is therefore an exercise in both discipline and creativity. The discipline is needed to structure the set of scenarios so that they reflect the issues requiring exploration. Creativity is needed in filling out the scenarios so that they become meaningful, consistent and plausible. Box 9.2 sets out a step-wise approach to the development of scenarios using the scenario axis technique.

Although evidence of the effectiveness of scenario planning in improving the robustness of long-term policy decisions is limited to date, there is little doubt about its value as a tool for stimulating debate among stakeholders about the future and its uncertainties.

Box 9.2: Step-wise approach to scenario building

Step 1	Specify the system and define the outcomes of interest.
Step 2	Identify external factors driving changes in the system.
Step 3	Identify system changes, connections between these factors and system changes and how the changes affect the outcomes of interest.
Step 4	Categorise the uncertainty of the factors and system changes.
Step 5	Assess the relevance of the uncertain factors and system changes.
Step 6	Select a small number of highly uncertain factors with high impact on the outcomes of interest.
Step 7	Identify relevant positions on these dimensions for a small number of scenarios.
Step 8	Describe other attributes for each scenario.

9.6 Futures research in action (1) – helping the European Commission to identify future challenges in public health and consumer protection

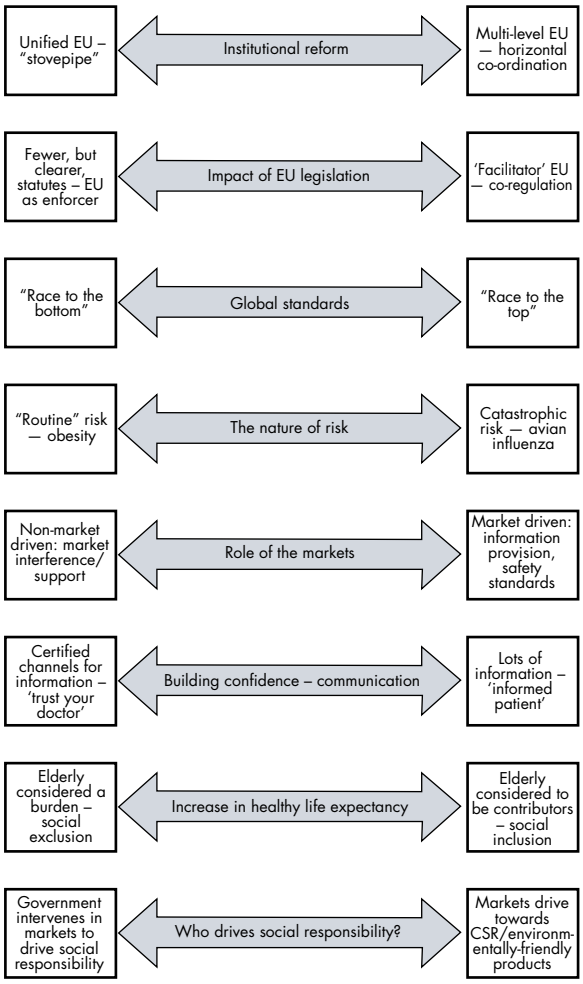
In 2006, the European Commission's Directorate-General for Health and Consumer Protection (DG SANCO) embarked on a series of activities to consider the challenges it would face in 2009–2014. RAND Europe supported this project by developing three scenarios for Europe to be set in the period 2009 to 2014, testing these scenarios in case

study workshops, and identifying the issues and challenges arising from the project.

The process of creating the scenarios for DG SANCO involved the gathering of data on major trends and key uncertainties affecting the future of public health and consumer protection. These trends and uncertainties were clustered in four areas: governance, confidence, changing society and globalisation. This information informed an internal workshop with SANCO staff that identified eight key uncertainties which would have the highest impact on the future of DG SANCO in 2009–2014 (see Figure 9.2).

Many scenario development approaches use a "scenario axes" method, which uses N crucial uncertainties as the scenario dimensions (or axes) in order to generate 2^N distinct scenarios. The main advantage of this approach is that it is easy to understand and communicate. However, where more than one or two critical uncertainties with high impact have been selected, the number of resulting scenarios is too large to use in a workshop setting. In this case, eight highly uncertain factors with high impact on the future of public health and consumer protection would have resulted in 256 scenarios. Instead, three scenarios representing a spread across the extreme ends of these eight uncertain dimensions were selected in a scenario development workshop with SANCO staff.

Figure 9.2: Eight critical uncertainties driving future change of public health and consumer protection



Following this workshop, RAND Europe fleshed out the three scenarios: Galapagos, Coral Reef and Wave. These scenarios were then tested and fine-tuned in four case study workshops, each of which focused on a particular element that could affect the future environment in which DG SANCO operates: nanotechnology, consumer behaviour, ethical food consumption and health equity.

Table 9.2: Brief description of the three SANCO scenarios

Scenario	Description
Galapagos	A diverse Europe characterised by varying interests and inequalities that are difficult to reconcile and which have left Europe weak on a global scale.
Coral Reef	An apparently well-functioning Europe, but with an increasing divide between a metropolitan elite and those uninterested in the European project.
Wave	A society in the aftermath of a crisis where citizens' confidence in information, provided by information and markets, regulation and enforcement needs to be regained.

9.7 Futures research in action (2) – the future of civil aviation in the Netherlands

Many European countries saw intense public debate on the future of aviation and their national airports during the 1990s. Schiphol, in the Netherlands, had experienced a period of considerable growth, while society increasingly observed both positive (eg economic) and negative (eg pollution, noise or safety) externalities. The Ministries of Transport, Public Works and Water Management (V&W), of Housing, Spatial Planning and Environment (VROM), and of Economic Affairs (EZ) commissioned a policy analysis study on the future of the Dutch civil aviation infrastructure. RAND Europe carried out this research, aimed at helping to develop answers to some of the policy questions to inform the public debate. Assuming that the Netherlands chooses to accommodate future air transport demands, the task was to assess infrastructure options for accommodating the demand, identify their positive and negative attributes, and draw conclusions about them.[1]

RAND developed five scenarios for the future of civil aviation in the Netherlands in 2025. They were not given names, but referred to as Scenario 1, Scenario 2, etc. They focused on two things: the world of civil aviation, and changes – both inside and outside the civil aviation system – that were relevant for making policy decisions about infrastructure investments. The study identified a number of structural uncertainties that would have a potential impact on the future of civil aviation in the Netherlands, including: (1) worldwide growth of civil aviation; (2) the configuration of the civil aviation system in Europe; (3) civil aviation policies within the European Union; (4) the development of competing transportation systems; (5) airport capacity in Europe; and (6) aircraft technology. The two uncertain factors with the highest potential impact determined the axes upon which scenario selection was based (see Figure 9.3). Table 9.3 provides an overview of the specific attributes of the five scenarios.

With these scenarios, the researchers assessed different infrastructure options.

1 Further details of this study are available in the draft reports published by RAND Europe (EAC 1997a; 1997b), which until 1997 went by the name of the European-American Center for Policy Analysis.

Options included building an airport in the North Sea to replace Schiphol, expanding Schiphol at its existing location, building remote runways in the North Sea, building a second national airport in addition to Schiphol, and building a separate cargo airport. Each option was examined in all of the scenarios and assessed on a set of qualitative and quantitative criteria.

The analysis provided information on the effects of a broad range of civil aviation infrastructure options and made it possible to compare the options on a consistent and logical basis. An important finding of this scenario study was that the relative ranking of the infrastructure options on each of the performance criteria was found not to differ over the scenarios. As with many of these assessments, however, the analysis did not result in an unequivocal preferred option, but preferences depended on the importance of the various criteria to the various stakeholders and policymakers.

Figure 9.3: Scenario axes for the future of civil aviation in the Netherlands in 2025

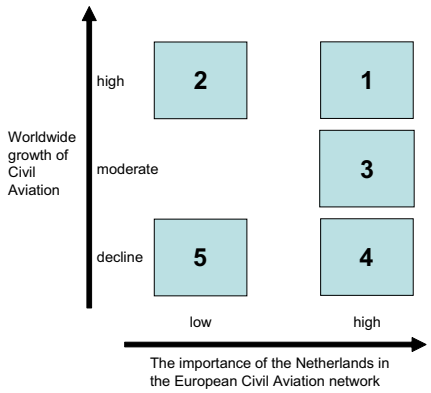


Table 9.3: Attributes of the future of civil aviation scenarios

Scenario No.	1	2	3	4	5
Worldwide growth of civil aviation	High	High	Moderate	Decline	Decline
Configuration of European civil aviation system					
Number of European hubs/international gateways	6	6	10	3	3
Number of European airlines	6	6	10	3	3
Ownership of airlines	Private	Private	Govt/ private	Private	Private
Competition in airline industry	High	High	Low	High	High
Hub or international aviation gateway in NL	Yes	No	Yes	Yes	No
Presence of European mega-carrier in NL	Yes	No	Yes	Yes	No
European Civil Aviation Policies					
Elimination of government subsidies to aviation	Yes	Yes	No	Yes	Yes
Existence of multilateral air traffic agreements	Yes	Yes	No	Yes	Yes
Substitute transportation modes					
Competition between high speed trains and air transport	Medium	Medium	High	Low	Low
Feeder role of high speed trains	Low	Low	Medium	Large	Large
Airport capacity in Europe					
Availability of airport capacity in Europe	Yes	Yes	No	Yes	Yes
Aircraft technology					
Proportion of mega-jumbos in aircraft fleet	Moderate	Moderate	Small	High	High

Source: EAC (1997b)

9.8 Summary

Futures research is used by both the private and public sector to prepare for possible future developments. Various methods of futures research have been developed over the past 35 or more years, and they all serve to improve agenda-setting, our understanding of uncertainty and stakeholder engagement.

9.9 Further reading

Kahn, H. and A.J. Wiener, *The Year 2000: A Framework for Speculation on the Next Thirty-three Years*, New York: Macmillan, 1967.

CHAPTER 10
Grounded theory *Richard Warnes*

10.1 Key points

- Grounded theory operates "backwards" compared to traditional research.
- Grounded theory takes an inductive approach, gradually building cohesion through the cumulative collection and analysis of qualitative data.
- Grounded theory uses different levels of coding to draw meaning from qualitative data.

10.2 Defining grounded theory

Grounded theory has been described by two of its key exponents, Strauss and Corbin (1998), as a theory which is "discovered, developed and provisionally verified through systematic data collection and analysis of data pertaining to that phenomenon" (p. 23). It relies on taking an inductive approach to qualitative data and adopting a research goal that can be modified or changed during the research process (see Bottoms, 2000), in contrast to more deductive theories and quantitative methods.

Thus instead of forming a deductive hypothesis before analysis, and then testing it against collected data, this process is reversed and the collected data is constantly analysed to allow an inductive hypothesis to "emerge" from within the data. Hence the results and any emerging hypothesis are "grounded" in that data, and a researcher's final conclusions may not appear until all the data has been collected, coded and comparatively analysed, having been frequently changed and amended during the process.

The originators of grounded theory, Glaser and Strauss (1967), state that "the purpose of the constant comparative method of joint coding and analysis is to generate theory more systematically … by using explicit coding and analytic procedures" (p. 102). Effectively, the researcher completes a highly systematic and logical comparative analysis of the data, coding emerging themes or categories of data and noting any thoughts, links or ideas that develop as the data is being processed.

Glaser and Strauss argue that this systematic "constant comparison" and coding allows the comparative analysis of qualitative data, leading to the emergence of more formal theoretical hypotheses.

10.3 When should grounded theory be used?

The flexible conceptual framework of grounded theory means that it is applicable to a wide range of field research on real-world phenomena. It is best suited when examining a medium number of qualitative data sources, such as a series of transcribed interviews from key informants with insight into the particular field or case study being researched. Clearly this sits well when completing qualitative case study-based research. Consequently, grounded theory has been used extensively to analyse qualitative data in the fields of public health, corporate recruitment, education and evaluation, among others (see Strauss and Corbin, 1997).

Grounded theory is very well suited to performance audits of systems and structures due to its applicability to the examination of practical phenomena, its reliance on the comparative analysis of data to allow an inductive hypothesis to emerge, its focus on drawing inferences from links in the data, and its

attempt "to get beyond static analysis to multiple layers of meaning" (Gray, 2004, p. 330; see also Locke, 2001).

10.4 How to use grounded theory

In their sourcebook on qualitative data analysis, Miles and Huberman (1994) describe the analytic sequence involved in applying grounded theory, which "moves from one inductive inference to another by selectively collecting data, comparing and contrasting this material in the quest for patterns or regularities, seeking out more data to support or qualify these emerging clusters, and then gradually drawing inferences from the links between other new data segments and the cumulative set of conceptualizations" (Miles and Huberman, 1994, p. 14). This procedure is usually applied to the textual analysis of data obtained through qualitative interviews of key individuals involved in a process or structure, although the data may be based on detailed field observations of phenomena and events.

The skills and competencies needed to implement this type of approach to the data can be considered in several distinct phases. The main methodological approach to processing qualitative data is through a three-stage process of "coding":

- open coding: comparing incidents applicable to each category
- axial coding: integrating categories and their properties
- selective coding: delimiting the theory.

Coding breaks down the data into as many categories as emerge, before re-integrating similar categories and identifying emerging themes. The categories chosen depend on the nature of the data, their applicability and practicality, and the decisions of the researcher. As the raw data is coded through these stages, concepts will emerge as the researcher begins to identify links and associations. As these thoughts and ideas emerge, it is critical to stop coding and note them down while they are still fresh in the mind. Such reminders can be anything from a hurriedly scribbled note in a margin to a detailed, typed research note.

10.4.1 Open coding

First, the data is analysed through open coding, fragmenting the material into numerous identified categories within the data, with each category, concept or issue identified being allocated a code (label). Glaser and Strauss (1967) state that "the analyst starts by coding each incident in his data into as many categories of analysis as possible, as categories emerge or as data emerge that fit an existing category" (p. 105), while Strauss and Corbin (1990) describe the process as "breaking down, examining, comparing, conceptualizing and categorizing data" (p. 61).

However, Gray (2004) reminds us that an important aspect of the process is "making constant comparisons … each time an instance of a category is found, it is compared with previous instances. If the new instance does not fit the original definition, then either the definition must be modified or a new category created" (p. 332). Consequently, as the data is progressively categorised and coded, sub-categories, links and other analytically developed thoughts will be identified from the "richness" of the qualitative material – all of which should be recorded to be examined later as part of hypothesis development.

Data can generally be coded manually at first, but as the process continues, appropriate computer software, such as *N-Vivo* (see Fielding and Lee, 1998), will probably become necessary. Computer coding can speed up the process and help with both coding and retrieval at a later stage.

The codes or labels given to the various categories identified in the disaggregated data are up to the individual researcher, but as Gray (2004) points out, researchers should be aware that categories can be developed in two ways, either according to specific properties or according to dimension. Researchers must recognise that "the development of properties and dimensions is crucially important because they are central in making relationships between categories and sub-categories and later between major categories" (p. 333), leading on to the subsequent analytical stages of the process.

10.4.2 Axial coding

Axial coding seeks to reassemble the data that was fragmented during the open coding process. This is achieved through relating subcategories and linked categories, and amalgamating them into a smaller number of overarching categories that explain the data. Thus the multiple categories generated through open coding will have to be examined with the intention of identifying connections between them. Related categories and sub-categories are then integrated under more general and wider categories.

The issue of whether such wider categories should be preconceived or allowed to emerge from the data led to a major doctrinal dispute between the originators of this methodology. Strauss (1987) argued for the use of four preconceived categories:

- conditions
- interaction among the actors
- strategies and tactics
- consequences.

However, Glaser (1978) developed a broader family of categories, as shown in Table 10.1 below, arguing that none of these should be applied unless they emerged naturally from the data as they were examined.

Notwithstanding such doctrinal disputes, Gray (2004, p. 333) identifies four factors that should be considered during the process of reassembling the disaggregated data into broader linked and integrated categories:

- the category
- the context in which it arises
- the actions and interactions that stem from it
- its consequences.

Table 10.1: Glaser's coding families

Family	Examples
Six Cs	Causes, contexts, contingencies, consequences, covariances, conditions
Process	Stages, phases, progressions
Degree	Limit, range, intensity
Dimension	Elements, divisions, properties
Type	Type, form, kinds, styles, classes
Strategy	Strategies, tactics, mechanisms
Interactive	Mutual effects, reciprocity, mutual trajectory
Identity-self	Self-image, self-concept, self-worth
Cutting point	Boundary, critical juncture, turning point
Means-goals	End, purpose, goal
Cultural	Norms, values, beliefs
Consensus	Clusters, agreements, contracts
Mainline	Social control, recruitment, socialisation
Theoretical	Parsimony, scope, integration
Ordering or elaboration	Structural, temporal, conceptual
Unit	Collective, group, nation
Reading	Concepts, problems and hypotheses
Models	Linear, spatial

Source: Adapted from Dey, (1999), p. 107 and Glaser (1978), p. 81

10.4.3 Selective coding

Having linked and integrated categories and sub-categories in the data, in effect re-assembling the raw data, they are then subjected to selective coding, where the data is integrated around a central category that has emerged from the data itself.

According to Strauss and Corbin (1998) "a central category has analytic power … what gives it that power is its ability to pull the other categories together to form an explanatory whole … a central category should be able to account for considerable variation within categories" (p. 146). Although both Glaser and Strauss provide separate guides to the criteria necessary for a central category, Dey (1999, p. 111) provides a useful summary of these criteria, which can be used to guide this stage:

- Central: it is related to many of the other categories accounting for variation in the data.
- Stable: it is a recurrent pattern in the data.
- Incisive: it has clear implications for a more formal theory.
- Powerful: it has explanatory power which carries the analysis to a successful conclusion.
- Variable: it is sensitive to variations in conditions, such as degree, dimension and type.
- Sufficiently complex: it takes longer to identify its properties than other categories.

To achieve this point in the research, Glaser and Strauss (1967) suggest that parsimony in variables will occur, the number of categories will be reduced and theoretical saturation will be achieved (p. 111). In practical terms, this means that while the theory solidifies, fewer new categories will be needed to cover the data as pre-existing categories suffice, until a point

is reached where no new categories are needed. Strauss and Corbin (1998) summarise, stating that "selective coding is the process of integrating and refining the theory. In integration, categories are organized around a central explanatory concept … once a commitment is made to a central idea, major categories are related to it through explanatory statements of relationships" (p. 161).

10.5 Potential pitfalls in applying grounded theory

Despite its usefulness and practicality, there are a number of potential pitfalls in the application of grounded theory as a research methodology.

Miles and Huberman (1994) are concerned about the flexibility of the conceptual framework upon which grounded theory is based and its design validity. While they acknowledge that its flexibility and inductive approach is preferred by many researchers, they submit that "tighter designs … with well-delineated constructs" (p. 17) provide greater construct validity, such as the use of multiple sources of evidence and the establishment of a chain of evidence. They also point out "that qualitative research can be out-right 'confirmatory' – that is, can seek to test or further explicate a conceptualization" (p. 17). This can be considered in practical terms as the fact that all researchers necessarily analyse and make sense of data from their own perspective – influenced by their own life experience as well as by their prior knowledge of the problem or issue. While on the one hand "there is a world of difference between the abstract knowledge in books and the practical knowledge required for and acquired in everyday experience – between reading what to do, seeing others do it, and doing it for yourself" (Dey, 1999, p. 101), there is also the negative side, that such life experiences also lead, no matter how hard a person tries, to personal subjective bias. There is therefore a consequent risk that in using grounded theory, with its flexible conceptual framework, researchers might merely reinforce and support their own preconceived concepts. Consequently, it is always beneficial to run any research past a colleague for their objective input.

Another potential pitfall is raised by Dey (1999), who expresses concern that, in using grounded theory as a research approach, there is the risk of focusing so much on the minutiae of coding and categorising the material that the researcher might lose a more holistic understanding of the data, in effect losing sight of the big picture. Consequently he suggests that "there are processes that we can only understand if we recognize the forest as a forest and refuse to analyze it in terms of individual trees" (p. 100). However, Strauss and Corbin (1998) counter that a number of these potential pitfalls are minimised or negated by ensuring the researcher has a level of theoretical sensitivity, that is "the ability to give meaning to data, the capacity to understand and the capability to separate the pertinent from that which isn't" (p. 42).

10.6 Grounded theory in action (1): a performance audit of counter-terrorism measures

Although not conforming to what might be termed more traditional performance audits, research is being carried out to identify the effectiveness of counter-terrorism systems and structures in seven "Western" countries, supported by the Airey Neave Trust and the National Police Staff College (Fielding and Warnes, 2009).

This research is based on over a hundred generic semi-structured interviews of key policing, military and security officials in the case study countries, utilising "how" and "why"

based questions regarding the various counter-terrorism systems and structures the country has introduced, their perceived effectiveness, and the impact they have had on civil liberties. Such questions are designed to generate explanatory knowledge (see Yin, 2003, Chapter 2: *Designing Case Studies*) and the resultant transcribed interviews are then used as the raw data, which are being processed through the use of grounded theory.

Each interview is coded using the systematic practical steps described above. In practice this involves subjecting the transcribed interview to open coding, where the data are fragmented into as many categories as emerge. These are noted and recorded, before similar categories and sub-categories are integrated together into wider, overarching categories in the second stage, axial coding.

These second-stage categories are then formally coded through the allocation of relevant titles. In the case of the specific research these have included: Context-History, Organisation-Structure, Membership-Recruitment, Drivers-Inhibitors and Tactics-Operations. This has proved particularly useful where a number of different interviewees from one country have identified the same issue, or structure, or where interviewees in different countries have identified similar methods or techniques of responding to the threat of terrorism.

As the research progresses, selective coding is developing; a single overarching theme emerges, which effectively covers the measures and responses introduced by a particular country. It is hoped that, ultimately, the resultant material will help identify best practice and the effectiveness of performance in the fields of legislation, policing, the military, intelligence and economics – in essence, those systems, structures and methods that best mitigate and counter the threat posed by modern terrorism.

10.7 Grounded theory in action (2): informing Lord Darzi's review of the National Health Service

A second example is taken from RAND Europe research on behalf of Lord Darzi's examination of innovation in the NHS. A range of NHS individuals, hospitals and trusts, medical academics and research institutes, professional societies and bodies, private sector organisations and medical charities were consulted. A number of these provided written responses to a series of questions regarding three key areas: barriers to innovation in the NHS, policy measures to improve such innovation, and significant challenges to the introduction of innovation in the NHS. These written responses and the information they contained were subjected to a form of grounded theory, where the allocation of letters for coding was staggered between researchers to check for analytic consistency. The constant comparative method was applied to the responses.

The first iteration of open coding resulted in over 1,500 codes. Integration through axial coding resulted in the generation of a codebook containing 60 codes, which was further reduced to 35 codes. These codes were then applied to all the written responses and, as a means of introducing a quantitative aspect to the research, the results were quantified and ranked. The delta was then calculated to see the extent of the difference in the rankings between the NHS sector, professional bodies, academia and the private sector. Finally a calculation was made of the total counts across all the stakeholders to identify the top five perceived barriers and the top five perceived policies in relation to the introduction of innovation in the NHS. This was then utilised as a briefing tool to inform and focus the wider research.

10.8 Summary

Grounded theory provides a great deal of flexibility in the processing of qualitative data. Awareness of the pitfalls and concerns allows researchers to mitigate any possible impact these might have on the quality of the research. Given its flexibility and effectiveness in analysing systems and structures, it is a useful research tool for performance audits, as can be seen in the examples above.

CHAPTER 11
Impact assessment *Jan Tiessen*

11.1 Key points

- Impact assessment is a form of ex-ante evaluation of possible future policy actions.
- Impact assessment explores and compares the costs and benefits of different policy options to determine which is the most beneficial overall.
- Impact assessments are also used to consult stakeholders, increase transparency, and build consensus for future policies.

11.2 Defining impact assessment

Impact assessment, often regulatory impact assessment, is a formalised form of ex-ante evaluation that is used to systematically assess the negative and positive impacts of proposed and existing regulations and other policy initiatives. As part of the wider "better regulation" agenda, the use of impact assessments in government has spread rapidly among OECD countries over the last decade, and the use of impact assessment methods is now a common feature of policymaking processes in many OECD countries as well as in the European Commission.

The main purpose of impact assessment lies in supporting evidence-based decisions about the best course of future action. Ideally, an extensive impact assessment enables us to identify the net benefits or costs of a policy and compare them with a set of different policy options in order to identify the option with the largest net benefit.

An important element of such an analysis is the quantification and monetarisation of expected future impacts. In administrative and political practice, however, impact assessments are not only used to provide an evidence base for policymaking, but are also used as a means of facilitating consultation and consensus building with stakeholders, and making policy decisions more transparent.

11.3 When to use and when not to use impact assessment

Impact assessments are usually conducted because they are a mandatory element of the policymaking and legislative process.[1] Prominent examples are, for example, the US, the UK, Australia and New Zealand, but countries like Ireland, the Netherlands, and Sweden also use impact assessment. Since 2003, the European Commission has had a mandatory impact assessment system, which is applied to all major policy proposals, including white papers and broad strategy documents (Radaelli, 2004).[2]

As impact assessments can be very extensive and require substantial resources, many countries limit their application. This is either done by defining the type of proposal for which they are required, or by formulating some kind of proportionality principle. In the US, a full regulatory analysis only has to be conducted if expected impacts are above $100 million (Office of Information and Regulatory Affairs, 2003). In the UK, only proposals that

1 (Regulatory) impact assessments are, for example, compulsory for at least some proposals in Australia, Germany, Ireland, the Netherlands, New Zealand, Sweden, the UK, the US and the European Commission.

2 For an overview of different IA practices see, for example, OECD (2004) or The European Observatory on Impact Assessment (n.d.)

have a cost effect on business or third parties have to be scrutinised using an impact assessment. The European Commission guidelines on conducting impact assessments state that the efforts put into an impact assessment shall be proportionate to the importance and scope of the policy proposal (European Commission, 2009). Other systems, like Ireland, attempt to reduce the burden caused by impact assessments by dividing them into two phases. All proposals are first subject to a screening impact assessment, and only if this preliminary analysis suggests significant impacts does a full impact assessment need to be conducted (Department of the Taoiseach, 2005).

If conducting an impact assessment, considering the proportionality of the work will thus be an important starting point. Second, the level of detail of the impact assessment will vary with the type of policy proposal being assessed; the more general the proposal, the more uncertainty there is as to how it could be actually implemented, and the less precise the assessment will be.

11.4 Conducting an impact assessment exercise

Impact assessment is not a method in the narrow sense; it is more a conceptual framework for use when conducting a specific type of ex-ante evaluation. This chapter thus focuses on the analytical steps that need to be conducted to produce an impact assessment.

Each country using impact assessments as part of their policymaking process has specific national guidelines, but nevertheless some key analytical steps can be identified to provide guidance on how to conduct an impact assessment. Listed below are the guidelines issued by the European Commission, which are among the most comprehensive impact assessment guidelines internationally (European Commission, 2009).

1. Problem definition
2. Definition of the objectives
3. Identification of policy options
4. Analysis and comparison of options
5. Presentation.

Due to the political nature of impact assessments and their consensus building function, consultation with stakeholders is often considered to be part of an impact assessment. More information on this element can be found in the chapter on stakeholder engagement.

11.4.1 Defining the problem

The first step of an impact assessment is to describe the problem which the suggested policy aims to tackle. In an impact assessment, this step is essential to demonstrate why there is a need for action at all. Some key questions will help define the problem:

- What is the problem?
- What is the scale of the problem?
- Why is it a problem?
- What are the drivers and root causes of the problem?
- Who is affected by the problem?

At this stage, an assessment of how the problem might develop if no action is taken and the status quo maintained might be conducted, to illustrate the nature of the problem. A more detailed assessment can, however, be provided as the "no action" option in the assessment of policy alternatives (see section 11.4.4).

11.4.2 Defining the objectives

Once the problem is defined, it is time to clarify the objectives of the interventions to be assessed. Defining the objectives is essential, as the objectives of a policy will be the ultimate yardstick against which to evaluate different policy options. For the purpose of the impact

assessment it will be important to at least differentiate between two levels of objectives:

1. High level, strategic objectives. These are often defined by the broad policy field, such as "improving the health of the population", "ensuring consumers make safe and informed choices" or "fostering economic growth".
2. Low level, operational policy objectives. These are the immediate effects expected by the policy intervention, such as an increase in organ donation rates or a reduction in the number of misleading food labels.

Sometimes, it might even be helpful to include medium level objectives. In any case, it is practical to organise the objectives into a hierarchical order and to link them together. In some instances, this may uncover inconsistencies in the objectives, and conflicting objectives that might not necessarily be achievable with the same policy. Trade-offs between these objectives will need to be discussed later, while assessing the options. A decision tree model or similar visual techniques can be used to organise the objectives (see Figure 11.1).

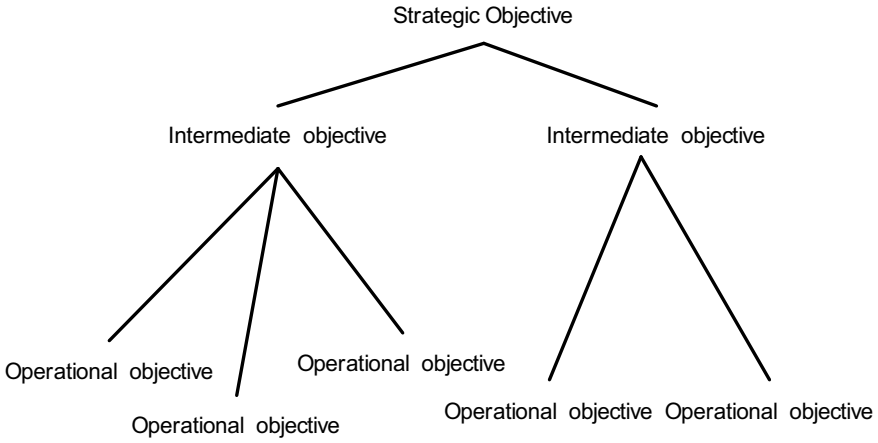
11.4.3 Identifying policy options

After describing the policy problem and the policy objectives, the next step is to consider the policy alternatives or options. Depending on the assignment, the task will either be to describe the policy option provided for assessment, or to draft different policy options. In drafting policy options, international common practice suggests:[1]

1. include a "no action" or "no change" option as a baseline scenario
2. include only realistic, feasible options
3. consider alternatives to "command and control" regulation, such as:
   - self-regulation

1 See, eg, IA guidance from Ireland, Australia, Sweden, the UK and the EC.

Figure 11.1: Hierarchy of objectives



- co-regulation
- economic incentives
- information campaigns.

The process of identifying options is best done in a two-stage process. In the first, open, brainstorming phase, a wide range of options can be considered. In the second stage, this wide range of options can be screened according to an initial test of feasibility and effectiveness to arrive at a manageable number of around three to four policy options.

11.4.4 Analysing impacts of different options

Having set out the policy problem, objectives and options, the analysis proceeds to the core of any impact assessment: analysing the expected impacts of the policy options. The process of analysing the impacts can be separated into four steps:

1. identification of impacts
2. analysis of impacts
3. comparison of impacts between options
4. presentation of comparison.

Identifying the impacts

To identify the potential impacts of a proposed policy option, a good place to start is to systematically map *potential impacts* of the policies being assessed. In doing so, the following dimensions of impacts should be considered:

- **Direct and indirect impacts.** Policies might have not only direct impacts, but also indirect effects that need to be considered. For example, making helmets mandatory for cyclists might reduce serious head injuries among cyclists, but at the same time it might lead to an unwanted reduction in bicycle journeys and an increase in car traffic.
- **Stakeholders.** Policies are likely to affect different stakeholders in different ways. Typical stakeholders are business and industry, citizens and public administration. Sometimes it is necessary to further sub-categorise stakeholders: for example, businesses can be differentiated by size or sector, citizens might be consumers, patients or taxpayers, the public sector might be affected at the local, regional or national level.
- **Type of impact.** Impact assessments try to capture the full range of impacts. It is thus important that an impact assessment is not only concerned with economic impacts, but also with less measurable and tangible social and environmental impacts. Most impact assessment guidance thus stipulates and assesses the economic, social and environmental effects of the proposal, with health impacts subsumed under social impacts.
- **Cost and benefit.** Finally, it is important to know whether impacts are positive or negative. Negative impacts are usually described in terms of costs, positive ones as benefits.

Using these dimensions, the impacts of the policy options can be identified. The questions set out to guide impact assessments issued by various bodies, such as the European Commission's guidance, which provides an extensive list of questions for all three types of impacts, can be used (European Commission, 2009, p. 32). Finally, consultation of stakeholders (often required in conjunction with impact assessments anyway), might help uncover further potential impacts.

Analysing the impacts

Once the most important direct and indirect effects of the proposed action have been captured, it is time to analyse the impacts. Analysis should be based on a thorough collection of evidence that can include document

and literature reviews, interviews with experts in the field, surveys of the affected stakeholders or statistical analysis. Analysis aims to compare the impacts of each policy option against each other and the status quo. In doing so, the aim of impact assessment is often to quantify (express in numerical values) and even monetarise (express in monetary terms) the impacts to increase comparability. Before starting the analysis, it might be helpful to sift through the long list of potential impacts to reduce the number of impacts for analysis.

For some impacts, in particular economic impacts, special analysis techniques are available. The European Commission requires, for example, that a simplified standard cost model be used to assess the administrative burden. Other countries have special requirements to assess the impact on small and medium-sized enterprises (SME) (Australia) or competitiveness (Ireland).

Comparing options

Ultimately, the analysis will need to allow the impacts of the different policy options to be compared. To do this, there are a number of techniques and methodologies available:

- **Cost-benefit analysis (CBA)** is the most rigorous technique for assessing the different policy options in an impact assessment. CBA aims to express all the impacts, positive or negative, in monetary terms and then to sum these up to arrive at the net benefit of a policy option. It can be attempted in full for all impacts, or partially for some impacts.
- **A cost-effectiveness analysis** can be conducted when benefits are difficult to quantify and all options attempt to achieve a clearly defined objective. The analysis will assess the cost-effectiveness of the options that achieve the desired objective.
- **Multi-criteria analysis (MCA)** is a method that is well suited to the practice of impact assessment, which is often plagued by a lack of sufficient evidence. It does not require a full quantification or monetarisation of all impacts. MCA is a way of systematically contrasting the available information about impacts for each policy option. This can be, for example, by stakeholder and impact type, or by negative or positive impact. On the downside, this method does not allow an optimal or best option to be clearly identified, as different types of information – monetary, quantitative and qualitative – have to be weighted against each other.

An MCA framework can be supplemented by a scoring exercise. In such an exercise, qualitative information is made more comparable by scoring each impact according to its severity on a scale. An example of such a scale can be found in Table 11.1 below. The scoring would need to rely on the expert judgement of the research team, based on the qualitative evidence reviewed.

Table 11.1: Scoring mechanism to compare non-quantifiable impacts

Score	Description
++	Evidence of substantial additional health/economic/social benefits compared to the status quo.
+	Evidence of some additional health/economic/social benefits compared to the status quo.
≈	Evidence of no additional health /economic/social benefits compared to the status quo.
-	Evidence of some reduction in health/economic/social benefits compared to the status quo.
–	Evidence of substantial reduction in health/economic/social benefits compared to the status quo.
?	No available evidence to assess changes in health/economic/social benefits compared to the status quo.

The advantages and disadvantages of all three options are summarised in Table 11.2 below.

Table 11.2: Comparison of methods to assess impacts

Method	Advantage	Disadvantage
Cost-benefit analysis	Accounts for all (negative and positive) effects of policy measures. Allows comparison of the ordering of costs with the ordering of benefits of the proposal over time. Can also be used to rank alternative (including non-regulatory) proposals in terms of their net social gains (or losses).	Cannot include impacts for which there exist no quantitative or monetary data. Needs to be supplemented by additional analysis to cover distributional issues.
Cost-effectiveness analysis	Does not require exact benefit measurement or estimation. Can be used to compare alternatives that are expected to have more or less the same outcome.	Does not resolve the choice of the optimal level of benefits. Concentrates on a single type of benefit (the intended effect of the measure), but would lead to an incomplete result if possible side-effects would not be assessed. Provides no clear result as to whether a regulatory proposal would provide net gains to society.
Multi-criteria analysis	Allows different types of data (monetary, quantitative, qualitative) to be compared and analysed in the same framework with varying degrees of certainty. Provides a transparent presentation of the key issues at stake and allows trade-offs to be outlined clearly; contrary to other approaches such as cost-benefit analysis, it does not allow implicit weighing. Enables distributional issues and trade-offs to be highlighted. Recognises multi-dimensionality of sustainability.	Includes elements of subjectivity, especially in the weighting stage, where the analyst needs to assign relative importance to the criteria. Because of the mix of different types of data, cannot always show whether benefits outweigh costs. Time preferences may not always be reflected.

Source: European Commission (2009)

Presentation

The final element in comparing policy options is the presentation of the final result. A tested approach is to use a set of comparative tables similar to those of an MCA framework. These tables can be tailored to the specific needs of the impact assessment. Table 11.3 below shows a table summarising some of the benefits of European action in the field of organ donation and transplantation. This table differentiates between different types of assessment (qualitative, quantitative and monetary) as well as providing a score (+ and ++) for qualitative evidence. Other tables could be produced to differentiate the impacts on different stakeholders, or to show an overview of only economic or health impacts.

Table 11.3: Example of a summary table

Benefits				
Impacts	Type of impact assessment	**Option A**	**Option B**	**Option C**
Donation rates	Qualitative	Increase possible, but very uncertain +	Increase likely ++	Increase likely ++
	Quantitative	Between 0 to between 8,000 and 20,000 more organs available per year	Lower estimate 2,500 and 5,000 High estimate 8,000 and 20,000 organs per annum	Lower estimate 2,500 and 5,000 High estimate 8,000 and 20,000 organs per annum
	Monetary		-	-
Life years saved	Qualitative	Gain possible, but very uncertain +	Increase likely ++	Increase likely ++
	Quantitative	Up to 113,000 to 220,000 QUALYs gained	Lower estimate 38,000 to 51,000 QUALYs gained High estimate 113,000 to 220,000 QUALYs gained	Lower estimate 38,000 to 51,000 QUALYs gained High estimate 113,000 to 220,000 QUALYs gained
	Monetary			
Treatment costs saved	Qualitative	Gain possible, but very uncertain +	Savings likely ++	++
	Quantitative			
	Monetary	Savings of up to €1.2b for best case scenario	Lower estimate €132m-€152m High estimate €458m to €1.2b	Lower estimate €132m-€152m High estimate €458m to €1.2b

Source: Based on Department of the Taoiseach (2005), using information from a study conducted by RAND Europe assessing the impacts of European action in the field of organ donation and transplantation (RAND 2008)

These tables will be useful for either identifying the best policy option or (and this is more likely) to illustrate the trade-offs between different, feasible policy options. For example, a self-regulatory solution might be less effective in achieving some of the objectives, but be considerably cheaper to implement and come with fewer burdens compared to a stringent regulation.

11.5 Impact assessment in action: quality and safety standards for organ donation and transplantation in Europe

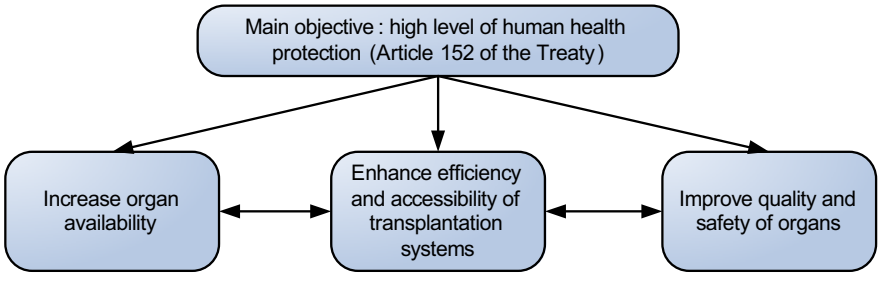
In 2008, RAND Europe was commissioned to support the Directorate for Health and Consumers (DG SANCO) of the European Commission in an impact assessment on the introduction of quality and safety standards for organ donation and transplantation in Europe.[1]

1. **Defining the problem**
   The European Commission proposal was intended to tackle at least two policy problems:
   - A shortage of available organs for transplantation, which exists despite substantial potential to increase donation rates in some countries.
   - There are currently no common standards of quality and safety in place in Europe; although cross-border exchange of organs, the mobility of organ recipients and potential donors, and the close link of organ donation to the use of human tissues and cells create major challenges to the diverse and heterogeneous regulatory landscape as it exists in Europe at present.

2. **Defining the objectives**
   DG SANCO defined three objectives for its proposed policies, which could all be linked back to the ultimate objective of achieving a high level of human health protection. Interestingly, there are certain trade-offs between making organs available on the one hand and improving the quality and safety of organs on the other,

1 It is loosely based on an impact assessment conducted by the European Commission Health and Consumer Directorate-General with support from RAND Europe. See European Commission (2008) and Tiessen et al. (2008).

Figure 11.2: Diagram of the three main policy objectives



Source: DG SANCO

as the latter might actually lead to an increased rejection rate due to quality and safety concerns.

3. **Identifying policy options**
   To address the policy problem, DG SANCO identified four policy options, which varied in their scope and their regulatory approach:
   - Option 1: the European Commission would continue with its current activities in the field of organ donation and transplantation, which primarily involve sponsoring research and pilot programmes in this field and participating in international cooperation such as in the Council of Europe.
   - Option 2 proposes a non-regulatory approach to the field of organ donation and transplantation. This option would establish a European Action Plan on Organ Donation and Transplantation for the period from 2009 to 2015. The Action Plan sets out a cooperative approach between EU Member States based on national action plans. This approach is based on the identification and development of common objectives, agreed quantitative and qualitative indicators and benchmarks, regular reporting and identification of best practices (open method of coordination).
   - Option 3 combines the Action Plan described under Option 2 with a "flexible" directive, supporting key elements of the Action Plan in the area of quality and safety. The regulatory approach of this directive would be very much a framework initiative, ensuring that national legislation was put in place to deal with key aspects of organ donation and transplantation, but without prescribing detailed policy measures.
   - Finally, Option 4 would combine the Action Plan described under Option 2 with a "stringent" directive.

   During the impact assessment, the options were only specified in principle. Detailed draft regulations only existed for Options 2 and 3, reflecting the consensus that the "no action" or "very stringent directive" options would not be politically desirable.

4. **Analysing the options**
   To analyse the options, first the most important impacts were identified and evidence collected to assess them. The collection of evidence included key informant interviews, document and literature review, review of statistics and country case studies. To structure the collection efforts, a causal model was drawn up linking the proposed actions to the intended and unintended impacts of the proposed policy.

   Once identified, the impacts for each option were analysed. Due to the uncertainty of the effects of the different options, this impact assessment resorted to a combination of benchmarking and scenario analysis to assess impacts.

   The Spanish system of organ donation and transplantation is considered to be one of the best systems in the world, producing very high donation rates. The policy measures were thus assessed in terms of their resemblance to the Spanish model, and in turn how likely it would be that similar organ donation rates could be achieved. Table 11.4 shows the results of this benchmarking.

Table 11.4: Benchmarking the policy option against the Spanish model

Key element	Option 1: Baseline	Option 2: Action Plan	Option 3: AP + flexible approach*	Option 4: AP + stringent directive*
Transplant coordinators and coordinating teams in each hospital	Variable within and across MS	All MS to "promote the role of transplant donor coordinators in hospitals"	All MS to "promote the role of transplant donor coordinators in hospitals"	All MS to "promote the role of transplant donor coordinators in hospitals"
Reimbursement of hospitals to recover procurement costs	Variable across MS	Not contained in policy option	Not contained in policy option	Not contained in policy option
A quality assurance system (or programme) in all autonomous communities, with two stages of evaluation	Variable within and across MS	All MS to (1) "[p]romote quality improvement programmes in every hospital where there is a potential for organ donation, which is primarily a self-evaluation of the whole process of organ donation, aiming to identify areas for improvement"; and (2) "evaluation of post-transplant results"	Legal mandate for (1) quality programmes, including quality systems and quality standards in all MS; and (2) inspections and control measures, subject to MS decisionmaking/ implementation	Legal mandate for (1) quality programmes, including quality systems and quality standards in all MS and (2) inspections and control measures, directed by the EU Commission
Adequate training for transplant coordinators and personnel involved in organ donation and procurement	Variable within and across MS	Promotion of the Implementation of effective training programmes for transplant donor coordinators	Legal mandate for personnel/ training in all MS, subject to MS decisionmaking/ implementation	Legal mandate for personnel/ training in all MS, directed by EU Commission
Public awareness and proactive management of mass media opportunities	Variable within and across MS	All MS to "[i]mprove knowledge and communication skills of health professionals and patient support groups for organ transplantation"	All MS to "[i]mprove knowledge and communication skills of health professionals and patient support groups for organ transplantation"	All MS to "'[i]mprove knowledge and communication skills of health professionals and patient support groups for organ transplantation"

*In addition, all actions foreseen under the Action Plan will be implemented.
MS = Member States; AP = Action Plan

To develop an idea of the scope of the improvements that could be achieved, RAND Europe then developed four scenarios of how the rates of both living and deceased organ donation might change. These were subsequently used to identify the likely health and economic impacts of the policy proposals. The key scenarios were as follows:

- Scenario 1 is the best-case scenario, with all countries achieving transplantation rates equivalent to the currently best-performing countries – Spain in deceased and Norway in living organ donation.
- Scenario 2 assumes all countries reach at least European average transplantation rates.
- Scenario 3 assumes a substantial increase in transplantation across all countries of 30 percent, based on the previous success of countries in substantially increasing donation rates.
- Scenario 4 is a small increase scenario, with a 10 percent increase across all countries.

The scenarios were used to define the scope of policy outcomes, based on assumptions about increases in organ donation rates, and were subsequently used to define the upper and lower ranges of possible policy outcomes for each option.

The scenarios allowed RAND Europe to compare some of the impacts in a quantitative way, although expert judgement was required to link the options to the scenarios, and substantial amounts of the data were qualitative, so the research team resorted to scoring the different impacts as well.

5. **Presentation**
   The results of the impact assessment were presented in a multi-criteria analysis framework, using a set of tables to show the types of impacts, as well as categorising them by stakeholders. The overview of the health impacts can be found in Table 11.5.

11.6 Summary

Impact assessment is an increasingly common tool for ex-ante assessment of the likely positive and negative impacts of a policy. In essence, impact assessments constitute a research framework in which a multitude of analysis techniques could be used, depending on the policy field and the actual proposal.

Despite being methodologically demanding, the major challenges encountered in impact assessments arise in the most part from the practice of conducting such a study. Impact assessments are usually conducted against very short timelines, there are very limited resources available and often data availability (within the short timeframe) is poor. A successful impact assessment thus needs not only to be well designed, but also to take into account these practical constraints.

Table 11.5: Comparison of the health impacts of proposed policy actions

Intervention	Option 1: Baseline		Option 2: Action Plan		Option 3: AP + flexible approach		Option 4: AP + stringent directive	
Donation rates	Donation rates will continue to be too low to meet rising demands for organs; thus leading to growing waiting lists	≈ to -	Depending on Member State (MS) commitment, zero to substantial increases are possible: - 0 to between 7,908 and 21,006 organs	≈ to ++	Medium to high increase possible: - lower estimate 2,636 and 4,983 - upper boundary 7,908 to 21,006 organs	+ to ++	Medium to high increase possible: - lower estimate 2,636 to 4,983 - Upper boundary 7,908 to 21,006 organs	+ to ++
QALYs and life years saved	No major change expected, but longer waiting lists and waiting times might reduce the medical outcomes of transplantation	≈ to -	Estimates of donation rates will lead to a range in MS from no change to significant change: - lower predictions show no major change - up to 119,314 to 231,006 life years saved - up to 113,348 to 219,456 QALYs gained	≈ to ++	Estimates of donation rates will lead to: - lower estimate of 39,771 to 54,320 life years saved - lower estimate of 37,783 to 51,604 QALYs gained - up to 119,314 to 231,006 life years saved - up to 113,348 to 219,456 QALYs gained	+ to ++	Estimates of donation rates will lead to: - lower estimate of 39,771 to 54,320 life years saved - Lower estimate of 37,783 to 51,604 QALYs gained - up to 119,314 to 231,006 life years saved - up to 113,348 to 219,456 QALYs gained	+ to ++
Risk to patients	No changes to the currently diverse regulatory landscape of quality and safety standards	≈	Better knowledge about organ transplantation outcomes will improve future transplantations for patients	+	Common quality and safety standards will ensure equal health protection in all MS Adverse event-reporting systems will improve the quality of donation and transplantation	++	Common quality and safety standards will ensure equal health protection in all MS Adverse event-reporting systems will improve the quality of donation and transplantation	++

++: substantial health benefit; +: some health benefit; ≈: no substantial health impact; - : some additional negative health impact; -- : substantial negative health impact; ?: no evidence

Continues

Table 11.5: Comparison of the health impacts of proposed policy actions (continued)

Intervention	Option 1: Baseline		Option 2: Action Plan		Option 3: AP + flexible approach		Option 4: AP + stringent directive	
Living donation	No change expected	≈	Will encourage more living donation May increase knowledge about medical outcomes Increases trust in system	+	Legal standards will supplement measures under the Action Plan and make them less uncertain to occur	+	Legal standards will supplement the measures under Action Plan and make them less uncertain to occur	+
Health benefits of cross-border exchange	Currently only very few organs are exchanged outside Eurotransplant and Scandiatransplant area, but potential for substantial health benefits	≈	Improved processes and removal of barriers to exchange of organs may increase exchange of organs and benefit small MS and difficult-to-treat patients	+	Common quality and safety standards will supplement measures under the Action Plan, which may increase organ exchange and make it safer	+	Common quality and safety standards will supplement measures under the Action Plan, which may increase organ exchange and make it safer	+
Health inequalities	Evidence suggests health inequalities in the practice of organ transplantation and donation along lines of gender, ethnicity and certain specific diseases	≈	Anticipated benefits from improved processes and removal of barriers to exchange of organs will not include reduced health inequalities	≈	Anticipated benefits from improved processes and removal of barriers to exchange of organs will not include reduced health inequalities	≈	Anticipated benefits from improved processes and removal of barriers to exchange of organs will not include reduced health inequalities	≈

++: substantial health benefit; +: some health benefit; ≈: no substantial health impact; - : some additional negative health impact; - - : substantial negative health impact; ?: no evidence

11.7 Further reading

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CHAPTER 12
Key informant interviews *Aasha Joshi*

12.1 Key points

- Key informant interviews provide insight into selected experts' understanding of the implementation, utility and efficacy of a programme.
- Key informant interviews require skilled interviewers if they are to yield useful information.

12.2 Defining key informant interviews

Key informants are those people within an organisation who have "specialized knowledge, skills, or expertise" (McKernan, 1996, p. 131). Thus interviewing key informants can be a useful method for understanding the particular contexts in which programmes are (or will be) implemented and how those contexts may shape the depth and extent of programme implementation within an organisation.

Although the information garnered from key informant interviews cannot necessarily be generalised to the organisation at large, it allows interviewers access to in-depth perceptions which are not easily accessible through a random selection of interview respondents.

Key informant interviews can provide general descriptions of the process of programme implementation, and can provide interviewers with particular insights into informants' understanding of a particular problem or programme, including a programme's viewed objectives, structure, implementation, utility and different outcomes. In the course of the interview, the informants will probably mention various phenomena including their beliefs, values, roles, experiences, behaviours, and relationships to others within an organisation, all of which can be important in understanding the area of investigation (Bryman, 2001, p. 319).

12.3 When to use key informant interviews

Interviews with key informants are most useful as a data collection method when the research objective is to understand informants' (possibly differing) views of a programme or common setting, to document their experiences in implementing a programme, or to describe differing outcomes across people or sites.

They are not as useful as a stand-alone method when the primary research objective is to measure outcomes across an entire setting or programme, or to determine the cause or effects of an implemented programme.

12.4 How to conduct key informant interviews

Successful key informant interviews depend on choosing the best way to ask questions for the required research objective, and on the skills of the interviewer in getting the most informative and detailed answers to those questions.

Deciding how to ask interview questions is contingent on why and about what the questions are being asked; the kinds of information needed to answer the audit's research questions will determine how to collect relevant information from the informants. To collect this information, one of the goals for the interview should be "to provide a framework [of questions] within which people can respond in a way that represents accurately and thoroughly their point of view about a programme"

(Patton, 2002, p. 21). For performance audits, this framework takes on two general interview forms: structured and semi-structured.

Structured interviews require that interviewers ask all of the informants an identical set of questions, which should be piloted for clarity and ease of understanding prior to the interview (Office of Auditor General of Canada, 1998, p. 30). Structured interview questions can be closed-ended, that is, the interviewer asks a question and offers the informants a set of possible answers from which to select their response, or they can be open-ended, that is, the interviewer asks a question and informants give their own impromptu responses.

An interviewer should choose the format of the questions depending on the type of information sought. For example, auditors may be interested in exploring collaboration patterns of customer service representatives. A possible closed-ended question might be: "Which of the following best describes your working behaviour?" The answer choices presented to the informant could be (1) "I never work alone"; (2) "I work alone less than half the time"; (3) "I work alone most of the time" (Zikmund, 1997, p. 388). A possible open-ended question might be: "How often do you work directly with your colleagues?" Informants would then offer their immediate response to the question.

Asking all of the informants the same questions has two primary advantages. First, answers to specific questions can be easily compared across all of the interviews. For example, for the questions above, auditors would be able to see immediately how often each of the informants worked with his/her colleagues, allowing them to identify possible patterns in work behaviour. Second, the standard format does not require interviewers to be highly practised or skilled, although they do need to be sufficiently trained to be aware of how they ask the questions and record responses, to avoid encouraging particular answers from the key informants.

A fundamental limitation of structured interviews is that the questions and answers do not allow sufficient, detailed access into the informants' points of view. With regard to the collaboration example, responses from the structured questions do not elaborate on the circumstances that influence certain behaviours (such as office location, nature of the work task or formal opportunities to exchange information with one another). It is these views that are integral to understanding the programme under investigation.

Semi-structured interviews attempt to address this limitation. They are particularly useful when trying to clarify a complex issue, such as determining if a programme was planned, implemented and managed in an appropriate way respective to time, cost and service outcome. Interviewers often use a mix of closed-ended and open-ended questions; they use the latter to respond, probe, and follow-up informants' answers. An initial set of pre-determined questions, which again have been piloted for clarity, are used as a guideline for discussion. Although all of the topics addressed in the pre-determined questions should be covered by the interviewer, the ways in which the questions are phrased, as well as the order of the questions themselves, is not limited.

The hallmark of semi-structured interviews is the flexibility they give the interviewer and the informant during the interview process. This flexibility relies on interviewers being able to listen attentively and to quickly discern when an informant should be prompted for further discussion after an initial response has been given. These prompts can take various forms, some of which are explained in depth by Kvale (1996) in *InterViews: An Introduction*

to Qualitative Research Interviewing. The described prompts include introducing questions, probing questions, specifying questions, direct questions, indirect questions, interpreting questions, structuring questions, and silence. Each can be helpful to the interviewer in patterning the interview into an informative data collection tool (rather than into an exercise in desultory maundering).

Table 12.1: Types of interview prompts

Prompt	Example
Introducing questions	Interviewer: "What does your role in the department entail?"
Probing (elaborating) questions	Interviewer: "Can you say something more about that [referring to a specific topic within the informant's response]?"
Specifying questions	Key Informant: "It's just not helpful to people." Interviewer: "Have you experienced that yourself?"
Direct questions	Interviewer: "Are you pleased with the quality of the customer service training?"
Indirect questions	Interviewer: "How are customer service representatives trained in the department?"
Interpreting questions	Interviewer: "I want to make sure I am capturing what you are saying. I have heard you say [recapitulation of informant's responses]. Is this a fair characterisation?"
Structuring questions	Interviewer: "We've talked a bit about [general topic], and I'd like to introduce a slightly different topic now."
Silence	Silence can provide the informant the necessary time to reflect and construct a complete answer to a question

Source: Adapted from Kvale (1996), pp. 133–135

Deciding when to use a particular prompt in a semi-structured interview relies exclusively on the discretion of the interviewer. Such discretion, in order to be exercised successfully, assumes that the interviewer possesses several particular qualities (Kvale, 1996). The effective interviewer:

- is gentle with informants, allowing them to complete their sentences and answer questions in their own timeframe
- is critical, addressing inconsistencies in the informants' answers
- is clear, asking simple, jargon-free questions
- is open, responding to themes noted as important by the informant
- is sensitive, attending and responding to verbal and non-verbal cues given by the informant
- understands the purpose of the interview and knows the overall study
- structures an interview so that its purpose and format are apparent to the informant
- steers interviews to keep to their intended purpose
- remembers previous answers and refers to them during the interview
- summarises (without imparting meaning) the informants' answers by asking for clarifying and confirming information when needed.

Ideally, the qualified interviewer will ensure that they ask the informant the sort of questions that will elicit the necessary information to answer the audit's overarching research

questions, the ultimate purpose of the interview.

If the interview questions are designed appropriately and they (and their accompanying prompts) are asked skilfully, the semi-structured interview should generate rich information about the topics under examination.

However, with this abundance comes the potentially limited ability to compare responses directly across all of the interviews. Given the leeway granted to interviewers in phrasing and ordering questions, as well as the possibly varying response styles of informants (ranging from discursive and verbose to concrete and reticent), answers to particular interview questions or even to the topics discussed will require an attentive eye during analysis.

Irrespective of the type of interview conducted – structured or semi-structured – there are some common pitfalls that should be avoided, such as conducting the interview in a noisy setting or leading the informants' responses (no matter how unintentionally). The interviewer should try to schedule the interview in a setting with minimal distraction, preferably a room with a closed door, in which only the interviewer and the key informant will be able to hear each other. If others can hear the informant, she or he may feel inhibited in offering candid responses.

Before the interview even begins, the interviewer should explain the interview process and its purpose. This explanation should address the scope of the interview, describing its general purpose (eg, to learn more about how a specific programme is working out; to figure out if any improvements need to be made to a particular process), and any topics that will be discussed (eg, programme need, costs, or achievements). Before the interviewer asks any interview questions, confidentiality (eg, if the informant's name or any other identifiable information will be made known to anyone outside of the auditing team) should be talked about, and the interviewer should encourage the informant to ask any clarifying questions about how any information obtained from the interview will be used. Finally, the interviewer should provide his/her contact information so that the informant can discuss any new concerns about the interview after it has concluded.

Table 12.2: Examples of common pitfalls in interviewing

- Interruptions from outside (eg, telephone calls or visitors walking into the room)
- Competing distractions (eg, loud noises)
- Nervousness in interviewer or key informant
- Interviewer jumping from one topic to another
- Interviewer instructing the informant (eg, giving advice)
- Interviewer presenting their own perspective on a situation

Source: Adapted from Field and Morse (1989), referenced in Britten (1995)

During the interview itself, the interviewer should record the informant's responses by taking detailed notes and preferably audio-taping the interview. After the interview, the notes should be written up, noting the questions answered or the topics discussed and the informant's responses, using the informant's own words as much as possible. To capture the informant's view accurately, the interview write-up should reference the audio-recording extensively.

Any unresolved contradictions in the informant's responses should be noted, along with their answers. Ideally, the audio-tapes should be transcribed in their entirety. The transcripts offer a verbatim record of both the

interviewer questions and informant answers, enabling more precise analysis. Recognising that transcription is time- and cost-intensive, the minimum requirement is that those sections of the interview directly relevant to the audit's research questions should be quoted verbatim from the audio-recording in the interviewer's write-up.

The auditors will draw conclusions based on analysis of the interview notes or interview transcripts. Refer to the grounded theory section of this handbook for guidance on one approach to analysing interviews.

12.5 Key informant interviews in action

Key informant interviews are often a contributing part of a research project; RAND Europe has used them in a number of projects. They can be used to:

- gain understanding of a specific area
- get views on practice in an area
- get perceptions or opinions on specific topics
- arrive at recommendations.

In many cases, semi-structured interviews do all these and are thus exploratory, but also look at potential views and recommendations that interviewees would have on particular topics. Most interviews that RAND Europe undertakes are semi-structured. For instance, on a project for the National Audit Office, trying to understand the UK hidden economy in comparison with other countries, we presented interviewees in international tax authorities with a detailed research template. This allowed respondents to give the interviewer insights on each topic that needed to be covered but also enabled them to take the template and provide more detailed responses via e-mail. Using both approaches allowed for more sustained interaction and thus avoided confusion over the questions in the research template. Moreover, it provided the researcher with more detailed information. The research template appeared as follows:

1. **General overview of the revenue system**
   a. Structure of tax administration
   - Organisational features of tax administration (special attention on units/directorates involved with hidden economy)

   b. Taxation
   - Breakdown of main revenue/ tax streams (special attention on particular country-specific taxes)
   - Overall tax burden
   - Balance between direct and indirect taxes in overall revenue

   c. Resources within tax administration for dealing with hidden economy
2. **Definitions of hidden economy**
   a. How is the hidden economy defined by tax administration?
   b. What is the size of the hidden economy? (using national estimates or those produced by the tax administration for all or a part of the hidden economy) – Are these estimates broken down further into subgroups? If the tax administration does not produce any estimates on the size of the hidden economy – what are the reasons for this? (difficulty/ complexity) In the absence of estimates, is there any qualitative assessment?
   c. Trends in the size of hidden economy
   d. Causes identified by tax administration and in the literature for the size of the hidden economy
3. **Strategy of tax administrations**
   a. What is the objective of the tax administration in dealing with the

hidden economy?

b. What priority does the tax administration give to the hidden economy compared with the other risks it is tackling? (Eg, is tackling the hidden economy in the top 10 priorities? Why has it been given this priority compared to other risks?)
c. What research has the tax authority carried out into the motivations of those in the hidden economy and how has it used the results?
d. What are the main risk groups identified by the tax administration (including concerns for the future) and the reasons? For example:

- labour providers
- construction
- buy to let
- young people
- e-commerce
- vulnerable low skilled
- taxpayers with offshore holdings, eg bank account deposits
- etc.

4. **Key initiatives of the tax authorities** What are the main initiatives used in the tax administration in the areas of:
   a. Encouraging people and businesses into the formal economy? (through helping people join the formal economy such as simplifying tax requirements for micro/small businesses, understanding and influencing behaviour, providing help to people to encourage them to transfer to the formal economy, voluntary disclosure schemes)
   b. Detection approach? (eg hotlines, data matching, internal referral, referrals by other organisations and the way detected cases are handled such as writing/telephoning initially to encourage businesses to register/ investigation of cases)
   c. Sanctions? (interest/surcharges/ financial penalties / prosecution/ numbers and amounts involved)
   d. Other?
   e. Are there examples of joint working across the public and private sectors in dealing with the hidden economy?
5. **Results achieved by initiatives**
   a. Measurement of impact of initiatives used in tax administration (using targets/ monitoring trends/ evaluations and other sources)
   b. Cost-effectiveness of initiatives (do tax administration report on cost-effectiveness; are there independent evaluations)
   c. Monitoring the compliance with tax requirements of those previously in the hidden economy.

12.6 Summary

Key informant interviews allow us to gather perceptions about a particular programme from experts who have in-depth understanding of the problems and issues involved. They can yield information that might not otherwise be accessible through more randomised data collection methods.

CHAPTER 13
Logic models *Lidia Villalba van Dijk*

13.1 Key points

- Logic models are graphic representations of the essential elements of a programme.
- Logic models encourage systematic thinking about the programme and its underlying assumptions.
- Logic models can be used to identify causality and expose gaps in a programme.

13.2 Defining the logic model

A logic model represents graphically the "key ingredients" or elements of a programme (inputs, activities, outputs and outcomes). Logic models make their users think systematically about the different elements of a programme, about the assumptions underlying the programme and potentially about other external factors affecting the achievement of the ultimate outcomes. By facilitating the identification of and linkages between the elements of a programme, logic models provide a better understanding of what may be achieved through the programme, and whether the proposed links between the different elements flow logically towards the intended outcomes. As a result, logic models can serve as an ideal guide to planning, monitoring and evaluation.

Until recently, logic models were widely used in the area of health and social welfare programmes. However, increasingly they are also being used in public sector work and in NGO work, mainly as a tool to demonstrate accountability through improved performance.

The most basic logic model depicts how a programme works. It is a graphical representation that describes how inputs or resources feed into a sequence of activities, and how these activities are linked to the results a programme is expected to achieve. In simple terms, a logic model illustrates the connection between **Planned work**, which describes the types of resources (or inputs) and the activities that need to happen to carry out a programme, and **Intended results**, which includes all the programme's results over time; outputs, outcomes and impacts (W.K. Kellogg Foundation, 2001).

McCawley (n.d.) suggests that even before populating the logic model, it is important to reflect on the **situation** of the programme – the statement of the problem, a description of who is affected and who is interested in the problem. Reflecting on the situation will give the evaluator an opportunity to communicate the relevance of the project, identify who has been affected, and provide a baseline for comparison to determine whether change has occurred. Then, we can start populating the elements of the logic model based on:

1. **Planned work**
   - Inputs are the resources needed to operate the programme. They typically include human resources (staff, volunteers, partners, etc), financial resources (funds, grants, donation, user fees, etc), other inputs such as facilities and equipment, involvement of collaborators (eg local and national agencies) and so on. It is possible to monetise all inputs, converting them into a certain currency value. Evaluations that compare programme costs

with outputs (technical efficiency) or programme outcomes (cost-effectiveness), or compare costs to monetised values of outcomes (cost-benefit analysis), all require estimates of inputs in a common currency.

- Activities or clusters of activities that are needed to implement a programme. The activities can be organised in work groups for each type or cluster of activities, or they can be organised so that activities are performed by different administrative units. How activities are organised and performed depends on the nature of the programme, the structure of the organisation, and the environment in which the programme operates.

2. **Intended results**
   - Outputs are the direct product of programme activities, and are typically tangible and countable. Outputs generally refer to what is being done or what is being produced. The type of output will depend on the programme under consideration. For example, the outputs of an advertising campaign might typically include the number of local press adverts, number of TV adverts, website activity and so on.
   - Outcomes are the intended (and often unintended) results that are linked to programme objectives. They answer the question: "What happened as a result of the programme?" These can take the form of changes in a participant's behaviour, knowledge, skills and status. Typically, outcomes tend to be categorised into short-, medium-, and longer-term programme results. Short-term outcomes range from one to two years, whereas medium-term outcomes typically cover three to seven years. The logic progression to long-term outcomes should be reflected in the impact of the programme.

Outputs and outcomes are often confused. Although they both indicate specific changes associated with activities, outputs are defined as the direct results of those activities, while outcomes refer to desired or wider intended (or unintended) results. Outcomes are one step ahead in the logic model chain. Outcomes are generally the consequence of a group of outputs that have been previously produced. The problem is that outcomes, which reflect programme success or failure, are often longer term in nature. It is best to identify the short- and medium-term outcomes first, before going on to identify and assess the long-term outcomes in order to understand the overall progress on the project or programme.

- Impacts are the fundamental direct and indirect effects of programme activities over a long-term period (7–10 years) on the wider community/environment. These include changes in economic/financial conditions, in social conditions (eg reduced violence or increased cooperation), or in environmental and political conditions (e. participation and equal opportunities).

Thinking ahead about the external factors that might influence the impact of a programme is useful because it helps us to identify realistic and accurate evaluation measures. The intended results of a programme are influenced by the programme environment. As programmes operate in open systems, environmental factors

can both augment the likelihood that the programme will succeed and at the same time impede the success of that same programme. Thus, specifying and thinking ahead about these influencing factors is a step forward in developing a logic model.

Figure 13.1[1] shows a basic logic model. Although the logic model itself reads from left to right, developing it should follow a retrospective approach. In other words, the evaluator should first start by specifying what will happen (the outcome/ impact), and then work backwards to identify the various elements of the logic model. Once the initial logic model has been developed, the evaluator might want to validate and identify potential gaps or weaknesses by following the chain from left to right and testing it step by step.

As well as providing a graphical representation of inputs, processes and outcomes, logic models allow auditors to connect the elements of the programme sequentially and establish causality between the parts. For instance, reading Figure 13.1 from left to right, we can observe that activities can only be implemented if there are enough resources. If activities are completed, the intended output should be the result. Hence, logic models make it conceptually easier to understand the causal connections. However, the causal links are not always obvious. Consequently, additional thinking might be needed to create "linking constructs" (McDavid and Hawthorn, 2006). Linking constructs can be conceptually thought of as transitions from the work done by the programme to the intended outcomes, or as processes that convert planned work into intended results.

Basic models rely heavily on linear causal links. Nevertheless, linking constructs can be non-linear, multi-dimensional and have significant feedback loops. Hence, it is important to recognise that no one-size-fits-all logic model exists. In fact, there are alternative ways of graphically representing the structure of a programme, the activities of a programme, how these in turn produce results, and how the different elements of a programme are linked together. It is up to the evaluator to craft a logic model that fits the particular features of a programme. Furthermore, in some situations, it may be unclear whether a given part of a programme fits into a particular category of the logic model, or just what the cause and effect linkages are. Developing a logic model is not a one-off process, but rather an iterative process between the evaluator's professional judgement and stakeholder consultations, aimed at eventually obtaining the best possible representation of a programme.

13.3 Why use a logic model?

The purpose of a logic model is to provide a roadmap illustrating a sequence of related events connecting the need for a planned programme with the programme's desired results.

The graphical nature of logic models has multiple benefits. First, in a broad sense, logic models allow evaluators to think more systematically about the different programme elements and how these link together. Consequently, strengths and weaknesses as well as gaps in the programme can be detected at the outset, hence contributing to better programme design and results. Second, by providing a succinct visual image of how a programme is expected to achieve its intended outcomes, evaluators can provide a more functional and practical way of categorising and describing programme processes and outputs. Visual models replace a thousand words, and describe in universal terms the purpose, components and sequence of activities and

1 Adapted from the Kellogg Logic Model Development Guide (W.K . Kellogg Foundation, 2001).

accomplishments of a programme, making communication and understanding easier (W.K . Kellogg Foundation, 2001).

The flexibility and openness that logic models offer also means that stakeholders can at least have some influence over how their work is described. Engaging stakeholders actively in logic model development can improve the precision and objectivity of logic models.

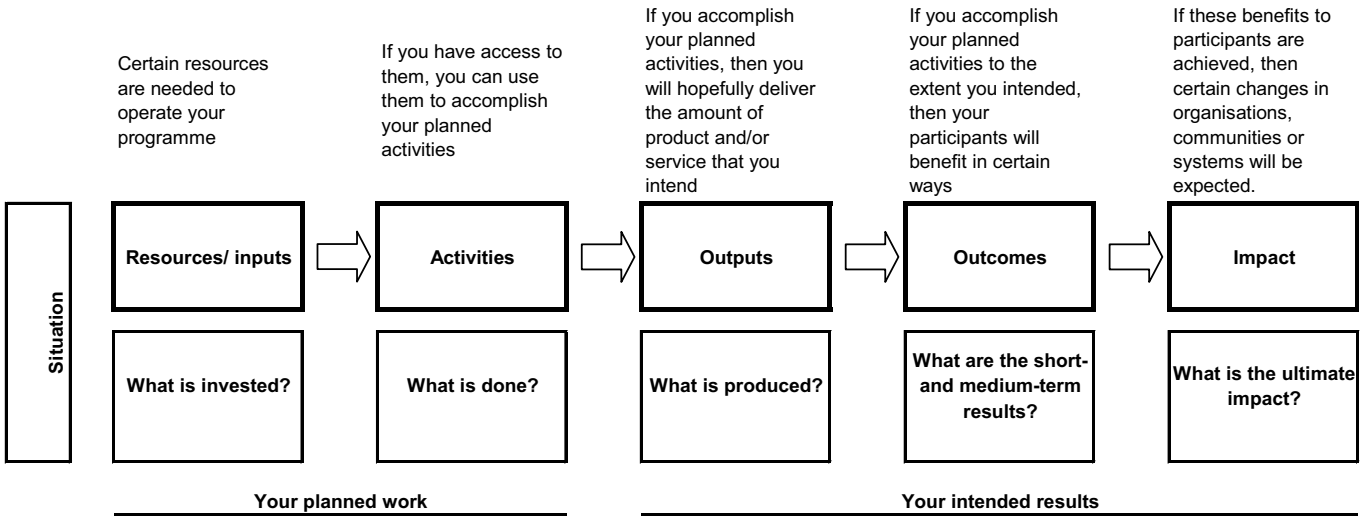
In addition to the benefits outlined above, the Kellogg Development guide expands further on the **benefits** of using logic models (W.K. Kellogg Foundation, 2001):

- Logic models better position programmes for success.
- By helping to organise and systematise programme planning, management and evaluation functions, logic models can contribute to a programme's success.
- Logic models strengthen the case for programme investment.
- The structure and visual nature of logic models, together with the organised approach to collecting and collating information, generally provide a clear picture of what you planned to do and why. This feature of logic models enhances the case for investment in a particular programme.
- Logic models reflect group process and shared understanding.
- Ideally, logic models should be developed in conjunction with the various stakeholders of the programme. The involvement of stakeholders is not only key to reviewing and refining the programme concepts and plans, but also contributes to getting everybody's involvement and buy-in.

There are also potential **limitations** with using logic models:

- Logic models cannot always be applied to programmes (McDavid et al., 2006).
- For example, this could be the case with particularly turbulent programmes. Under such circumstances, developing logic models might not be a useful and effective way of understanding the dynamics of a programme, nor of how planned work relates to intended outcomes.
- Logic models cannot capture the counterfactual.
- Another limitation of logic models is their inability (on their own) to capture the counterfactual. Logic models do not show what would have happened without the intervention in place, or if another intervention had been implemented.
- Like programmes, logic models are dynamic and time-limited.
- It should not be forgotten that logic models are only an instant picture of a programme at a specific moment in time. In other words, as the programme develops and changes, so too will the logic model. A logic model is a work in progress, a working draft that can be refined as the programme unfolds. If a logic model is not updated, it may become obsolete and, potentially, misleading.
- Logic models may miss feedback loops.
- Logic models are linear and might therefore miss feedback loops and fail to reflect learning across initiatives. To communicate these feedback loops, evaluators may highlight them during interviews or workshops. However, occasionally, it might not be possible to capture or understand feedback loops directly through logic models, since logic

Figure 13.1: The basic logic model



models combine goal hierarchy and time sequence.

- Logic models sometimes identify programme "reach" poorly. In fact, logic models treat the "who" and the "where" on a rather secondary level, focusing more on the causal chain between the different elements of the logic model than on reach. Montague (1998) identifies some problems when models focus poorly on reach:
  - By not paying enough attention to reach (stakeholders), impacts tend to be more narrowly defined.
  - By not addressing reach in logic models, people will confuse outputs and outcomes. For example, Montague mentions that "improved access" is confusing: does it mean available access or usage by the target group? "Service quality" is also ambiguous: does it relate to conformity to a standard set or does it mean satisfaction of user needs? Including reach as part of the thinking process in a logic model helps to distinguish outputs from outcomes.

13.4 When to use logic models

Conceptually, logic models are helpful tools for framing evaluation questions, programme planning and implementation, and programme evaluation.

13.4.1 Framing evaluation questions

A logic model is a simple, but representative tool for understanding the context in which a programme works. By addressing questions that explore issues of programme relationships and capacity, evaluators will be able to better understand how the programme relates to the wider economic, social and political environment of its community. Furthermore, logic models are a helpful tool for identifying potential gaps or issues during implementation that need to be addressed to deliver the programme as planned (Programme Planning and Implementation), and determine the programme's progress towards desired changes in individuals, organisations, systems and communities (Performance Evaluation).

13.4.2 Programme planning and implementation

One of the most important uses of the logic model is in programme planning and implementation. A logic model illustrates how a programme will work, identifies the factors that potentially will affect the programme, and enables the planner to anticipate the data and resources (inputs and activities) needed to achieve success. It forces the evaluator to clarify its theory of action. At the same time, by providing a good conceptual 'snapshot' of the programme, the logic model serves as a useful planning tool for developing an adequate programme strategy. This will include the identification and collection of data for programme monitoring.

13.4.3 Performance evaluation

Performance in the private sector is often measured in terms of financial benefit or increased sales. Traditionally, governments also used to describe programmes in terms of their budgets. However, financial resources spent on a project do not necessarily reflect on the programme's success or failure. Consequently, governments and NGOs have adopted new ways of assessing performance and understanding what progress has been made towards the intended outcomes. A programme logic model can provide relevant indicators, in terms of output and outcome measures of performance.

It is a useful tool for presenting information and progress towards goals previously set.

13.5 How to develop a logic model

13.5.1 Factors to be taken into account before developing a logic model

Before starting to develop a logic model, some important factors need to be taken into consideration:

- Logic models are best used to depict major, recurring items within a programme, rather than individual items. The logic model should provide a macro perspective as well as an overview of the interactions between the different programme elements. As a result, focusing too much attention on the small details of the programme might be distracting and ineffective.
- The size and the level of detail of a logic model can vary, but overall it should be such that readers can easily study the model without extensive reference. One author suggests a logic model should be one or two pages long (McNamara, n.d.). Detail should only go so far as to communicate the major items of the programme to the reader.

13.5.2 Specific steps in logic modelling

To create a logic model, the first step is to reflect on the situation of the programme. As explained earlier, an outline of the situation should provide a good overview of the relevance of the project, that is, a statement of the problem, a description of who is affected and which other stakeholders might be interested in the programme.

Once the elements of the programme *situation* have been identified, it is important to reflect on what is ultimately intended by the programme, in other words, the intended outcomes and impacts. Then there is a backward process linking the various elements of the logic model.

To populate the logic model, data need to be collected in advance. To collect such data, the following steps should be considered:

- Review any documents that describe the programme and its objectives. These can include policy documents, working papers, memoranda, etc.
- Meet and interview programme managers and programme stakeholders to learn more about the purposes and activities of the programme, as well as to get further information about how the programme will meet the intended outcomes.
- Construct a draft logic model based on the information collected during the first two steps, (eg following the structure of Figure 13.1).
- Present the draft logic model to programme managers and stakeholders (ideally the same people interviewed) as part of an iterative process. It may be necessary for the evaluator to explain what a logic model is and how it clarifies the structure of the programme and its objectives. Once the model has been presented, discussion with programme managers and stakeholders should help to fill any information gaps and, if necessary, to fine-tune the model.

Finally, after completing and reviewing the draft logic model with the stakeholders, it should be revised and validated as a workable model of the intended processes and outcomes of the programme. This would be the final logic model. The evaluator must remember that a logic model can be represented in multiple ways (eg different levels of detail), so there may not always be a common understanding of how the model should look.

Document reviews, interviews and focus groups are most commonly used to populate a logic model. However, there are obviously other methods that could also be employed. Regardless of the method selected, the development of a logic model always involves a significant amount of professional judgement.

13.6 A logic model in action: combating benefit fraud

In collaboration with the National Audit Office (NAO), RAND Europe examined six initiatives to combat fraud in the Department for Work and Pensions (DWP) in 2007. The initiatives represented different aspects (prevention, detection and deterrence) of an integrated strategy to tackle fraud, operated by different parts of DWP. The initiatives selected for the analysis are represented in Table 13.1.

Table 13.1: DWP initiatives selected for analysis

Initiative	Area	Responsible within DWP
"Targeting Fraud" advertising campaign	Deterrence/ Prevention	Communications Directorate
National Benefit Fraud Hotline	Detection	Contact Centre Directorate
Data Matching Service	Detection	Information Directorate
Fraud Investigation Service	Investigation	Benefits Directorate
Customer Compliance	Prevention	Customer Services Directorate
Administrative Penalties and Criminal Prosecutions	Correction	Solicitors' Branch

Each of the above initiatives was investigated in detail following the same method. For each of the initiatives, a logic model of relevant inputs, activities, outputs and outcomes was constructed, with the aim of relating the resources invested to actual outcomes. Logic models were used to provide a structure for these.

Below, we describe the use of logic models for the "Targeting fraud" advertising campaign.

Background: A description of the initiative "Targeting Fraud" advertising campaign (the intervention studies)

In a bid to discourage active benefit fraud and make fraud socially unacceptable, DWP sought

to increase the general public's awareness of the negative implications of fraud through two advertising campaigns via the national press, television and radio, and other media.

The first of these campaigns centred on the phrase "Targeting Benefit Fraud". It ran from March 2001 to March 2006. The second campaign focused on the message "No ifs, no buts", and launched in October 2006. This campaign was designed to appeal to the individual's sense of responsibility, differing from the earlier "Big Brother" approach. In addition, it aimed to raise awareness to reduce customer error as well as fraud. To understand what was invested, what was done and what the outcomes of the initiative on the advertising fraud campaign were, a logic model was developed.

Developing the logic model for the initiative

In a first phase, preliminary models were constructed on the basis of desk research using published literature and internal documents provided by the DWP. In a later stage, logic models were completed and validated in a series of workshops run jointly by RAND Europe and the NAO with selected DWP staff. These workshops included interviews and a group workshop. Both the interviews and the workshops were structured around the four principal areas of logic modelling: Resources/ Inputs, Activities/Processes, Outputs, and Outcomes. The resulting practitioners' input informed the more detailed construction of the logic model set out below (Stolk et al., 2007) (Figure 13.2).

Developing logic models with staff responsible for delivering the initiatives allowed a "thick narrative" to be developed and agreed, highlighting complexities and challenges as well as revealing both formal and informal ways in which these were overcome. As pointed out by Stolk et al. (2007), the visual representation of the "theory of action" makes understanding between participants easier.

13.7 Summary

Logic models are graphical representations of the inputs, activities, outputs, outcomes and impacts of programmes or projects. Logic models allow users to think systematically about a programme's elements and how they link together, identifying potential gaps, developing a common understanding of the programme among stakeholders and organising information in a practical and structured way. Therefore, logic models are appropriate for framing evaluation questions, programme planning and implementation as well as performance evaluation. Yet logic models are context specific. If programmes are particularly complex, with significant feedback loops and highly changing dynamics, the evaluator might want to consider using a different approach.

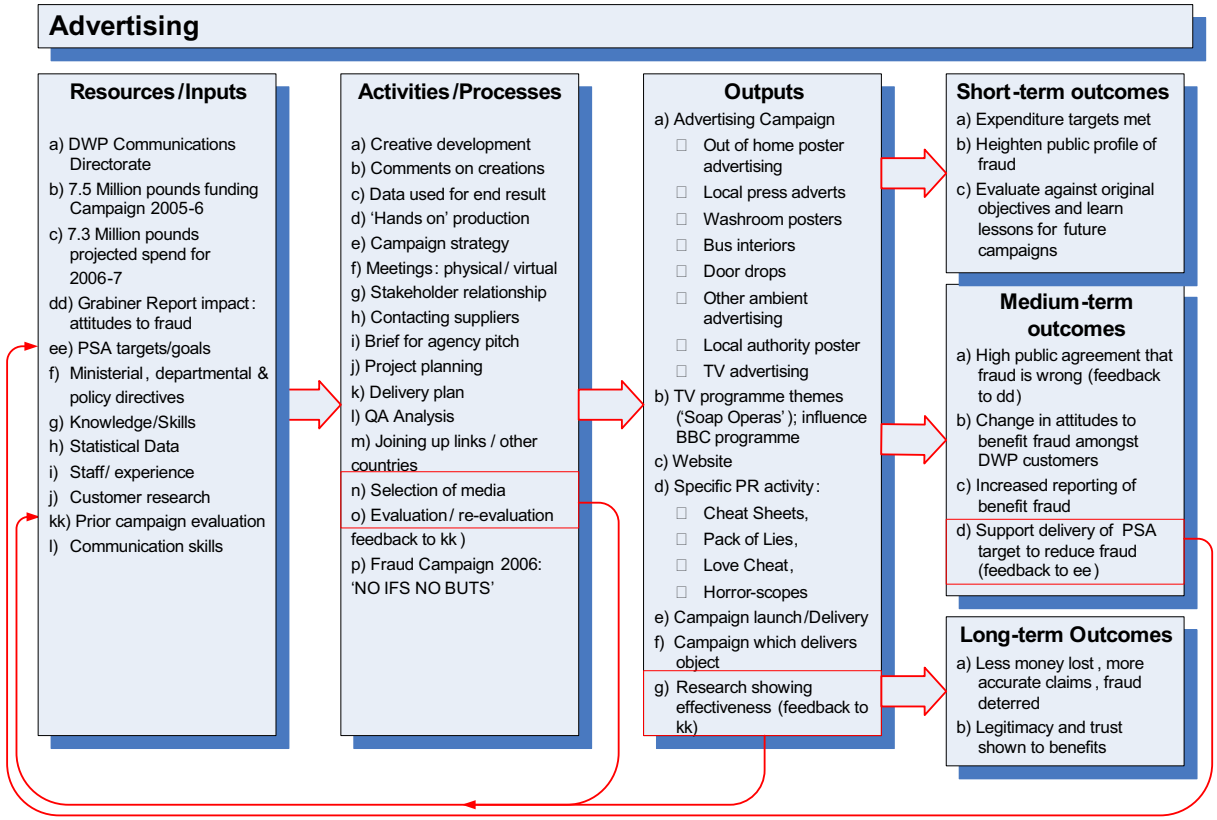
13.8 Further reading

Devine, P., *Using Logic Models in Substance Abuse Treatment Evaluations*, Fairfax, VA: National Evaluation Data and Technical Assistance Center, Caliber Associates, 1999.

Hernandez, M. & S. Hodges, *Crafting Logic Models for Systems of Care: Ideas into Action*, Tampa, FL: University of South Florida, The Louis de la Parte Florida Mental Health Institute, Department of Child & Family Studies, 2003.

W.K. Kellogg Foundation, *W.K. Kellogg Foundation Evaluation Handbook*, 1998. As at 6 October 2009: http://www.wkkf.org/Pubs/Tools/Evaluation/Pub770.pdf

Figure 13.2: Logic model "Targeting Fraud" advertising campaign



CHAPTER 14
Network analysis *Priscillia Hunt*

14.1 Key points

- Network analysis explores the relationships between individuals or other actors, and the information flows between them, numerically and graphically.
- Network analysis describes networks systematically and compactly.
- Network analysis can identify key influencers.

14.2 Defining network analysis

Network analysis is the "mapping and measuring of relationships and flows between people, groups, organizations, computers, web sites, and other information/knowledge processing entities" (Krebs, 2004). The patterns of connections between individuals and groups form a network and the structure of such networks influences social and economic trends and outcomes.

The aim of network analysis is to describe networks systematically and compactly. The amount of information in network analysis needed to describe patterns, even in small networks, is vast. By formally representing all the necessary information through the rules of network analysis, a researcher can synthesise connections in an efficient and systematic way. It is a method to gauge visually interactions and to assess the power of relationships.

Network analysis has been used in many applications, such as disease transmission, terrorist networks, innovation diffusion, tacit knowledge in organisations, the world wide web, and international trade. Network analysis provides answers the following types of questions:

- Who are the central members of a network?
- Who are the peripheral members of a network?
- Which people have the most influence over others?
- Does the community break down into smaller groups and, if so, what are they?
- Which connections are most crucial to the functioning of a group?

14.3 When to use network analysis

Researchers conduct extensive investigations of networks in economics, mathematics, sociology and a number of other fields, in an effort to understand and explain network effects. The technique allows for predictions about the behaviour of a community, as a function of the parameters affecting the system.

The main aims of network analysis are to:

- illustrate a complex system
- create understanding of relationships
- identify problems with the flow or existence of a network.

Illustrate a complex system

Social network analysis allows us to identify how to best use knowledge and promote the flow of knowledge or commodities. When a public or private organisation seeks to provide a visual illustration of how ideas are shared or a commodity flows from one person to another, it is helpful to use network analysis.

Understand relationships

As access to information and the maintenance of relationships becomes more sophisticated, network analysis provides an empirical

framework to evidence social and economic interactions.

Identify problems

In order to sustain a successful start-up company or provide effective public services, problems must be identified to assess and improve transmission of knowledge.

14.4 When not to use it

Network analysis is not an instrument for normative assessments. That is, it is not used to describe the way something ought to be done. There are two specific reasons for this – network analysis does not illustrate why relationships exist nor how the interactions take place.

Social network analysis does not provide details about why actors perform tasks in a particular manner or why they feel connections or do not. The underlying reason for the relationship is not illustrated in a network graph or matrix. Therefore, it is inappropriate to use network analysis to suggest how things ought to work in a network – even if it appears that the entire network will be more efficient if two people without an established relationship develop one, it does not necessarily mean such a relationship can be built. There may be an underlying reason why one does not already exist. Further to this point, it is possible that the development of other relationships results from a lack of relationships elsewhere in the system.

In addition, network analysis does not capture how relationships function on a daily basis. Although the suggestion that certain relationships within a network ought to have links elsewhere may in itself be true from an efficiency and effectiveness point of view, the practical implications of adjusting or adding relationships may not be feasible because network analysis does not take into account how the link operates. For example, it does not identify that two people use email frequently whereas two others are more likely to speak on the telephone.

14.5 How to conduct network analysis

The four key steps to network analysis are:

1. define the boundaries
2. collect the data
3. design the network
4. analyse the network.

Step 1: Define the boundaries

The initial step in social network analysis is to determine the population under investigation. This seems relatively straightforward; however, in many instances, it is difficult to separate the relevant from irrelevant actors.

There are two approaches to defining the boundaries of the actor set: realist and nominalist (Laumann et al., 1989).

The *realist* approach focuses on actor-set boundaries and membership as perceived by the actors themselves. For example, an artist club can be a social entity because individuals involved acknowledge themselves as members of the club.

The *nominalist* framework is defined by the researcher for the needs of the research, so the list of relevant actors is a construct of the researcher. In the example of an artist club, the researcher may be interested in the impact of new arrivals on the club, and so confine the boundaries to new members.

Step 2: Collect the data

The collection of data entails gathering information from a variety of sources and managing all the information in an efficient and effective way.

Gathering

The first stage of data collection involves developing a complete picture of the connections between people. This is achieved through discussions with those involved and reviews of relevant reports. Empirical evidence is acquired using various methods, including:

- interviews
- questionnaires
- observations
- archival records
- snowball sampling
- ego-centred studies
- experiments.

The type of data to collect depends on the nature of the study and the boundaries set. There are two types of data: structural and composition variables. Structural variables measure the relationships between pairs of actors. Composition variables measure actors' attributes and are defined at the individual level. Examples of composition variables include gender, race, age, ethnicity and geographic location.

Managing

Once the evidence has been gathered, it is likely to be in various forms and relatively disorganised. The data needs to be gathered into a spreadsheet to identify gaps and organise what is probably a large quantity of information into a documented format. Generally, all attributes (quantitative and qualitative) are arranged for each individual or group under investigation. Table 14.1 is an example of information gathered on four individuals and the number of relationships they report with other individuals in the sample.

Table 14.1: Summary of data

Name	Sex	Age	Relationships
Person A	Male	30	2
Person B	Female	28	1
Person C	Female	51	3
Person D	Male	45	1

Source: Author

Step 3: Design the network

There are two approaches for developing and analysing networks: matrix and graph theories.

Matrix formation allows a researcher to compare subjects' attributes for similarities and dissimilarities. There are two basic matrix formulations, rectangular data array and square array, which depend on the number of rows and columns. The matrix comprises rows and columns that are cases, or subjects. The relationship between a particular row and column is represented as an element in a cell (quantitative or qualitative). Relationships are expressed as a score in the cells of a matrix. This type of matrix is most commonly illustrated as a table.

Social network analysis also makes use of concepts from graph theory. A graph, also known as a *sociogram*, is composed of points, called *nodes* or *vertices*, and lines connecting them, called *edges*. A node is an actor and an edge is the relationship. A line joining two nodes represents a relationship between those two nodes. A graph may represent a single type

of relationship among the nodes (simplex), Examples of a multiplex can be *friendship* and *business partnership*.

Matrix

Matrices are used to keep information in a compact form. The matrix used in network analysis is termed an *adjacency matrix*, often denoted as the matrix **A**. For example, Table 14.2 illustrates a four-by-four adjacency matrix (four rows, four columns) with elements indicating whether or not there is a relationship between two actors, as chosen by the row actor ("Chooser"). These elements are binary (0 = no relationship, 1 = otherwise). Note that the standard convention is to label actors by capital, bold-type letters.

Table 14.2: Reported working relationships

	Choice:			
Chooser:	**Person A**	**Person B**	**Person C**	**Person D**
Person A	–	0	1	1
Person B	1	–	1	0
Person C	1	1	–	1
Person D	0	0	1	–

Source: Author

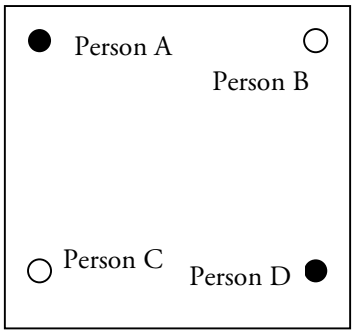
The adjacency matrix can either be symmetric or asymmetric, which is intuitive because two people do not necessarily feel the same way about each other. Person A may feel close to Person B, yet Person B does not feel close to Person A. As seen in Table 14.2, Person B reported no link to Person A and Person A reported a link to Person B. This is an asymmetric adjacency matrix; formally, where *i* and *j* are nodes of the row and column, asymmetry is $A_{ij} \neq A_{ji}$.

Other than binary measures (0,1), the level of measurement can be signed or valued. Signed distinguishes how a relationship is valued. A subject can like (+), dislike (-), or not care (0) about another subject. A valued measure is a rank ordering of responses.

Graphing

The first step is to plot the nodes in a sample space, as seen in Figure 14.1. The nodes can be different colours, shapes or sizes to represent particular attributes. In this example, white circles are female, black circles are male.

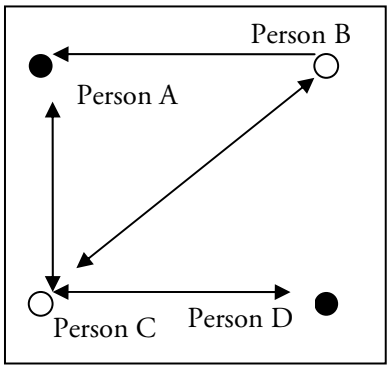
Figure 14.1: Simple graph nodes



Source: Author

The next step is to introduce lines to express ties and arrows to express the direction of those ties. A line segment indicates a "bond" in which the two nodes have indicated closeness. This requires more descriptive information, such as signed or valued. Arrows express information about a tie and require binary information. A double-headed arrow indicates a reciprocated tie. In Figure 14.2, we illustrate the direction of ties (based on information provided in Table 14.1).

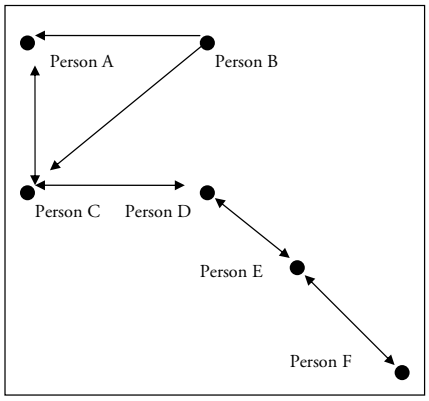
Figure 14.2: Multiplex relations



Source: Author

Figure 14.3 shows how peripheral relationships exist that can initiate a network. This is often found for suppliers to an industry, or external regulators, for example.

Figure 14.3: Social network – a "Kite Network"



Source: Author

The most widely used software for social network analysis is UCINET. There are many other software packages available; network analysis websites will provide the most up-to-date reviews.

Step 4: Analyse the network

Analysing a network provides insights into the most influential actors. Influence can be thought of in a number of contexts – having the greatest number of relationships, having the highest number of close relationships, or being the go-between or connector for many relationships.

These concepts all come under the heading of "Centrality". Centrality measures are the most fundamental and frequently used measures in network analysis. The four most notable centrality measures are:

- degree centrality – number of relationships
- betweenness centrality – level of control in relationships
- closeness centrality – familiarity within relationships
- eigenvector centrality –strength of relationships.

Who are the central members of a network? Degree centrality (also known simply as "degree") measures the number of relationships. Generally speaking, a node with many edges is an influential actor because more choices increase the number of opportunities. In most social and economic settings, the individuals with the most connections have the most power and influence. Therefore, the degree of a node in a network is the number of edges (or lines) attached, which is calculated as the sum of edges from vertex i to j:

$$k_i = \sum_{j=1}^{n} A_j$$

where A is the adjacency matrix of size $n \times n$, n is the number of nodes in the network, and

k is the total number of relationships. This is a relatively straightforward equation and yet quite powerful as an effective measure of the influence of a node.

The next two concepts, "betweenness" and "closeness", are both concepts of network paths. A path in a network is a sequence of nodes traversed by following edges from one to another across the network. These paths are "geodesic" – a geodesic path is the shortest path, in terms of number edges traversed, between a specified pair of nodes. There is no reason why there cannot be two paths that are both the shortest.

Which connections are most crucial to the functioning of a group? Betweenness measures the fraction of information (or any other commodity) that flows through a node on its way to its destination. Suppose the flow between nodes in a network takes the shortest route, a node with substantial influence will have a high level of betweenness, either by being in the middle of the network or by being between other nodes on the way to the destination node.

Which people have most influence over others? Closeness centrality is lower for vertices that are more central, because they have a shorter network distance on average to other vertices. Closeness is generally defined as the average geodesic distance to all reachable vertices, excluding those to which no path exists.

Lastly, the relatively more complex version of analysis is eigenvector centrality, which is another measure for finding which people have the most influence over others. Eigenvector centrality incorporates the idea that not all relationships are the same. That is, some relationships are stronger than others, in which case the edges are weighted and represented through thicker or thinner lines. The persons having more influence than others, in this context, are the persons with contact who also have influence. To allow for this effect, the equation to solve is:

$$x_i = \frac{1}{\mathrm{m}} \sum_{j=1}^{n} A_j \, x_j$$

where μ is a constant. Therefore, x is proportional to the average of the centralities of i's network neighbours.

14.6 Summary

Network analysis is a quantitative way of exploring the relationships in a network. The mathematical and graphic tools used illustrate how quantitative analysis can help us to understand complex patterns of interaction. Social network analysis can then be used to develop perspectives, models and paradigms for relationships where the links between people in a network are the focus, rather than the characteristics of the people involved.

14.7 Further reading

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CHAPTER 15
Online tools for gathering evidence

Neil Robinson

15.1 Key points

- Online surveys are widely used in both the public and private sectors.
- Online surveys can be used to target specific stakeholder groups.
- Online surveys need to be carefully designed through a partnership between the researchers and web-survey implementers.

15.2 Defining online surveys

Online tools have become an extremely cost-effective method of conducting fieldwork for scientific, social, business and policy research, and include web-surveys, opinion surveys, stated preference, online Delphi exercises and more open-ended forms of e-consultations (see Shonlau et al., 2002, Chapter 3 for a good overview). In the consumer area, these tools are frequently used by market research companies to study likely markets for certain products and services through opinion surveys or general omnibus studies.

This chapter discusses the use of online tools in a specific policy research context. This context is not the same as fieldwork for policy research among a sample of a general population of citizens or consumers (or those that are not familiar with the technicalities and principles of policymaking processes) but rather as a tool for evidence gathering from stakeholders who have more direct interaction with policymaking.

Although it is difficult to characterise from a theoretical point of view, various types of stakeholder may be considered as relevant targets for this form of evidence gathering. For example:

- civil servants and members of administrative departments, agencies and public bodies – so-called policy practitioners, they will have knowledge of the policy domain that such tools are being used to investigate and will be familiar with the terminology
- private sector representatives
- experts
- academics
- civil society stakeholders.

Surveys can be conducted in a panel format, with a known sample that is carefully scoped to be representative of a greater population, or using an unknown sample size, where the survey is conducted purely on a best effort basis with no guarantees as to the relationship of the respondents to the total population size.

15.3 When to use online surveys

In the policy context, online survey tools are especially useful for gathering honest views of practitioners, as the respondent feels that they are talking to a computer rather than a person.

The successful use of online data gathering techniques is, like many methodologies, a compromise among a number of factors. The main consideration will be that of understanding the implications of more complex instruments given the specificities of using more traditional forms of data collection.

Online surveys are particularly suitable in the following circumstances:

- **When the boundaries and characteristics of a topic or subject can be easily determined in advance.** In this instance, it should be easier for those developing the survey instrument to represent questions in an "important / not important" or "agree / disagree" manner, thereby permitting extensive question sets. This method is particularly useful when trying to simplify questions that could be answered qualitatively (eg what do you think about…?) so that they are presented quantitatively (please indicate the extent to which you agree / disagree with the following…).
- **When there is a large or unbounded sample.** Online survey tools may be appropriate when considerations of robustness of sample size to population are of lesser importance.
- **When fast turnaround is necessary.** Surveys can be developed extremely quickly, especially when an existing survey platform is established. Furthermore, some tools permit automated data extraction.
- **When budget is limited.** Online tools may be a cost-effective alternative to more expensive forms of data collection (eg via telephone surveys), as they are relatively cheap to implement.
- **When there are known characteristics about respondents.** Online tools are likely to work best where the characteristics of respondents are known in advance. Examples include a known sample size (eg number of civil servants in a department) or use of a particular IT set up. The latter, in particular, helps to address technical bugs and inconsistencies caused by myriad varieties of computing platforms.

15.4 When not to use online surveys

Online policy research is generally not suitable in especially complex policy environments, where other written evidence must be cross-referenced to understand the context of responses.

Web surveys (one form of online research method) are not well suited to gathering responses where the boundaries and structure of the domain are not known in advance. This is because web surveys are generally at their most effective when using closed questions, which keep the respondents' attention. Online consultations or more open-ended techniques (using email or forms delivered via email, for example) are better suited to solving these problems.

Challenges exist in regard to self-selection, bias and where the relationship between the sample size and total population size cannot be robustly quantified or determined in advance. These may not be as relevant where the respondent is likely to be knowledgeable about the topic or subject. Such challenges are more common where surveys are, for example, conducted on a sample of the national population.

The most common problems with online surveys, in order of importance, are:

- **When the survey instrument is especially long or complex.** This is the most crucial factor. All too often, questionnaires are developed by one part of a study team and then handed to a web-survey developer to implement. Experience shows that the earlier those responsible for translating a questionnaire or instrument into an online format are engaged with the project team actually drafting the questionnaire, the better.

Generally, this will involve finding a suitable compromise between the survey designers and those charged with implementing it online.

- **Where iteration is required (which has a negative impact upon response rates).** Online tools are not generally particularly effective at multi-stage Delphi-type exercises, since the repeated interaction and iteration, which can only be achieved via the respondent revisiting a web page or survey site, tends to negatively affect response rates. The limited exception to this is for a Delphi conducted via email, due to its directness.
- **Where the evidence and the evidence gathering process is closely integrated, for example focus groups).** Unless a computer-aided technique is used (eg an interviewer going through a survey with a respondent via the telephone), online tools are not suited to those forms of evidence gathering that seek to understand how consensus is formed in a dynamic, real-time fashion, since it is impossible to observe how the responses are arrived at.
- **Where complex forms of interaction (eg trying to identify a position on a process timeline or map) are required.** This may be technically difficult to implement, although new non-textual forms of collecting data (eg via mouse clicks) are starting to deal with such challenges.
- **Where language and cultural issues play a crucial role**. The English language is dominant on the web, particularly in the implementation of Unicode characters for many forms of online communication. For those surveys where there are unique character sets (eg Cyrillic or pictogram based languages such as Japanese and Mandarin), the complexity involved in developing and testing an instrument to be used in such an environment may outweigh the benefits afforded by this technique.

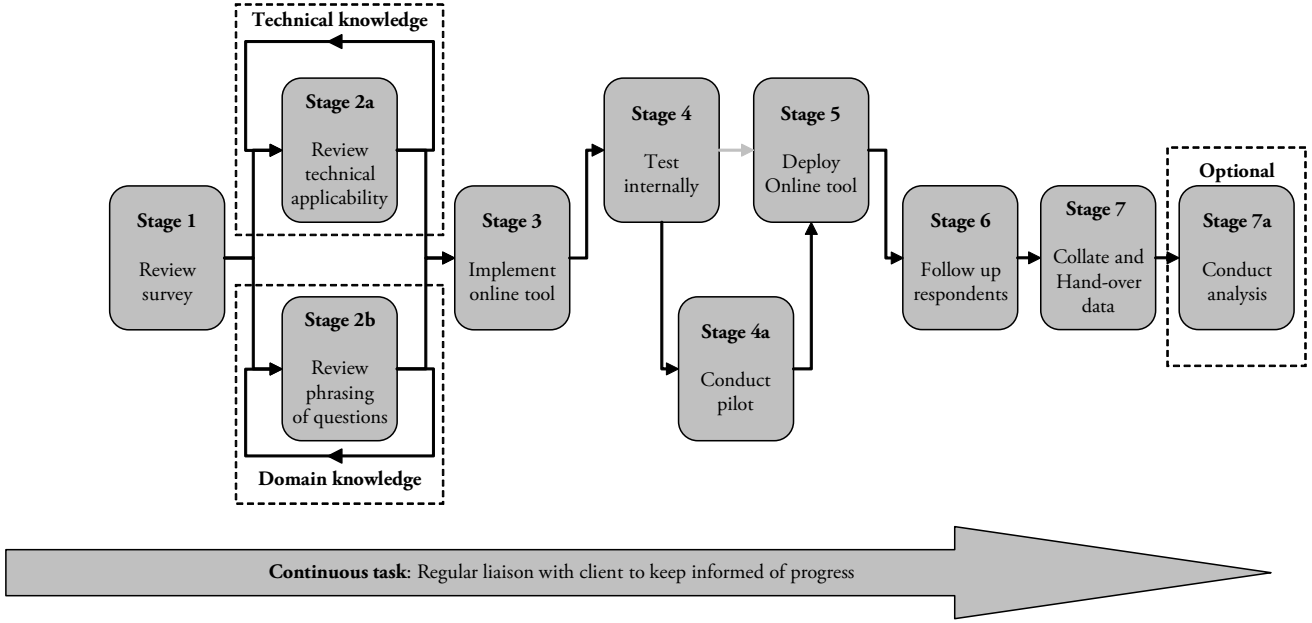
15.5 Conducting online surveys

There are a number of important contextual factors to consider regarding the *scope* and *design* of a data gathering instrument to be used as the basis for online deployment.

The success of any online data collection may be largely determined by the characteristics of the underlying instrument or set of questions – how complex the questions are (eg questions that may have dependencies or piping from one question to another), how many questions there are, and the mode of the questions (eg open-ended vs. Likert Scale). Certain measures can mitigate these risks, for instance following up survey invitees, carefully considering survey design with regard to usability, and utilising previous experience in conducting online fieldwork.

The various steps associated with implementing online tools are described below.

Figure 15.1: General process of implementing online data collection tools



Source: RAND Europe

Stage 1: Review survey

Initially, the data-gathering instrument is reviewed to answer the following questions: What is the structure of the online instrument required? How many sections/questions does it contain? How complex are the questions? How many stakeholder groups are expected to be addressed and are there different surveys for each? The answers to these questions will impact both on the details of implementation and the expected response rate. In general, as online data collection tools get longer and more complex, the response rate drops. It is good practice not to try to deploy something that will take longer than a maximum of 15–20 minutes for a response, otherwise the response rate declines considerably.

Stage 2a: Review technical applicability

The online instrument is reviewed and refined, bearing in mind the technical advantages and disadvantages of such tools. For example, web-based surveys can be constructed with yes/no, radio-button, drop-down list and open-text questions, questions where user information is "piped" from one question to the next and "condition"-based questions that are only presented if certain preceding answers have been given. Conditioned questions are of critical importance, as they can be used to reduce the effective length of a survey. A web interface also limits the type of questions that can be used. For example, complex, graphical questions may need to be adjusted to allow for answers to be supplied with a drop-down list.

Stage 2b: Review phrasing of questions

The phrasing of survey questions is of critical importance, as misinterpretations and loss of nuance can often lead to erroneous results. This is a far greater challenge than the technical implementation of an online tool. The aim in this phase is, where possible, to use domain knowledge to adjust the language and question phrasing and thereby reduce the possibility of confusion, bias or misunderstanding in the response. This stage is critical to ensuring that the survey gets the results that the study team require. The refinements of stages 2a and 2b would ideally be discussed with the project sponsors at an interim meeting, to agree the form and function of the online instrument. At this meeting some of the mechanics for implementing the survey should also be discussed and agreed. For example, requiring respondents to log in, any introductory text outlining the survey (an important part of maximising responses), links to documents required or any other material for the respondents to review, numbers of different surveys targeted at specific groups and any other associated issues.

Stage 3: Implement online tool

Following agreement with the project team, the survey is then implemented on the online platform. While a full discussion of the various survey tools is beyond the scope of this chapter, various factors should be considered, including the particular requirements of the project (eg whether respondents will be expected to complete the questionnaire in one sitting, how invitations will be distributed), the complexity of the instrument (eg multiple choice questions or those requiring non-textual interaction), robustness of the selected platform (eg number of version), and experience of those required to use and implement the instrument in the platform. At a general level, the 80/20 rule holds for the online part of the implementation; it takes 20 percent of the effort to implement 80 percent of what functionality is required. Any remaining problems usually require significant effort to solve, negotiate or find a suitable way to work around them.

Stage 4: Test internally
Once the survey is implemented, internal testing is conducted. It is at this stage that email invitations and embedded hyperlinks are checked, the performance of the instrument in various web-browsers (eg Opera, Internet Explorer and Firefox) is checked, and data collection verified (whether the instrument is recording data in the appropriate way). These checks will reduce the occurrence of problems with the survey both at the pilot and deployment stages. When this stage is completed, a link to the final survey instrument is sent to the project team for a final opportunity to review.

Stage 4a: Conduct pilot
Following internal testing, the online instrument is then piloted with a small sample to test understanding amongst likely respondents and iron out any final technical issues. The objective here is to ensure, to the greatest degree possible, that the respondents understand the questions in the same way as the creators. Details on the pilot group would be provided by the Supreme Audit Institutions (SAI), and would comprise a small, representative subset of respondents. Piloting would involve deploying the survey to the pilot group, asking them to complete the survey and then conducting a cognitive telephone interview with respondents to determine any complications. The piloting is used to validate the internal testing, to check phrasing of the questions and to address, where possible, any technical interface issues. This stage may be omitted or shortened depending on the number of intended participants.

Stage 5: Deploy online tool
After successful piloting, the instrument is deployed across the sample of stakeholders. Names of participants can be provided either by the SAI or determined independently; however, enough resource must be dedicated to this task. A particularly useful form of deployment that has worked well in the past is via intermediary organisations (eg membership organisations which count stakeholders as members), that can act as force multipliers for the distribution of the instrument. It is always good practice to establish a clear feedback mechanism for technical support queries.

Stage 6: Follow up respondents
Once the survey has being deployed for a short time period, non-respondents are followed up. Depending on the number of responders outstanding, this will be either via email or telephone. This follow-up is intended to maximise response rates.

Stage 7: Collate and hand over data
Once the survey is completed, the data can be collated and exported in a suitable format, either electronic (eg .csv, .xml, SPSS, .xls, .rtf) or paper-based.

Stage 7a: (optional) Conduct analysis
Using the data collated from the survey, analysis is conducted to extract results and conclusions. The numerical data can also be presented in a graphical form, allowing for easy understanding. It is useful to provide a workbook of tabulated results, indicating the questions, responses and analysis in a logical manner.

15.6 Online surveys in action: reviewing impact assessments

RAND Europe was asked by the European Commission to review the process of impact assessments (the EC formal ex-ante evaluation process) across a number of Directorates General. The study used an electronic survey, implemented on RAND Europe's online platform, ClassApps SelectSurveyNet version

2.8.2 (ClassApps, n.d.). Initially, a number of iterations were required between the project team and lead technical architect responsible for implementing the instrument in the platform, which illustrated the need for close liaison between those developing the questions and those required to translate them into something that would be usable in an online environment and maximise response rates.

Another interesting characteristic of this survey was in regard to the different types of stakeholder. Respondents were grouped into different classes of stakeholder and slightly different questions were asked of each grouping. The use of an online electronic tool made this easier, since a base instrument was created and then copied and adjusted to reflect the slightly differing questions.

Following internal agreement on the survey instrument and testing, the link was sent to the European Commission for verification. Minor changes were requested, which were implemented directly on the online instrument. Due to limited resources, a full pilot was not conducted (the testing with the client being considered as a pilot). The link was then distributed to relevant groups within each Directorate General for completion. As this was an unbounded sample (ie it was done on a best-effort basis) no statistical quantification of the relationship between respondents, sample size and population size was conducted.

Respondents were given two weeks to complete the survey and follow-up was via email (but telephone might have increased the response rate). Drop off or completion rate (the difference between the numbers that clicked the survey, answered the first question and answered all of the questions) was in line with expectations at around 40 percent.

Data was extracted directly into Excel and analysed, following which a report was provided to the client.

15.7 Summary

Online surveys can provide an efficient way of collecting information from different stakeholder groups, anonymously if necessary. Best results are achieved if the auditors and those implementing the online survey collaborate in developing the survey from an early stage.

CHAPTER 16
Payback framework *Sonja Marjanovic*

16.1 Key points

- The Payback framework is used to assess the impacts of research.
- The Payback framework categorises and determines indicators for research benefits and uses a logic model to assess those benefits.

16.2 Why do we need to evaluate research?

Evaluation can be defined as "a systematic and objective process designed to assess the relevance, efficiency and effectiveness of policies, programmes and projects" (Fahrenkrog et al., 2002, p. 15). There are a number of reasons for evaluating research (cf Brutscher et al., 2008)[1]:

- To ensure that researchers, policymakers and funding bodies are transparent and accountable for the way research funds are spent.
- To evaluate whether milestones have been reached and help steer the research process towards desired outcomes by facilitating timely remedial actions.
- To provide a means for advocacy, for example by using the results of an evaluation to signal the ability to conduct research, or the credibility to fund it.
- To provide an input into the research management process via learning from the past experience of research projects.

Over time, a number of research evaluation frameworks have been developed. They all attempt to provide a template and guide for conducting evaluations, while also facilitating the use of multiple sources of evidence and analysis methods, and increasing the validity and reliability of conclusions from an evaluation (Buxton and Hanney, 1996, Wooding, Anton et al., 2004, Brutscher et al., 2008).

16.3 Defining the Payback framework

The Payback research evaluation framework was developed by the Health Economics Research Group at Brunel University (Buxton and Hanney, 1996), and subsequently refined in collaboration with RAND Europe (eg Wooding et al., 2004, Hanney, Grant et al., 2004).

The framework consists of (1) a multi-dimensional *categorisation of benefits* from research and (2) a *logic model* of how to assess them. It is a tool for evaluating a comprehensive range of potential outputs from research, and (unlike most other research evaluation frameworks) also provides a way of conceptualising the *process* by which outputs are created (ie the logic model).

1 For an alternative (more narrow) list see: Georghiou, et al. (2005).

Box 16.1: Categories of benefits from research in the Payback framework

A. Knowledge production
- Advancements in knowledge on a topic, produced through the research

B. Benefits to future research and research use
- Better targeting of future research (knowledge produced by prior research can indicate and sometimes dictate new research agendas)
- Human resource capacity building: staff recruitment, training and professional development benefits
- Physical infrastructure capacity building: lab and office space, equipment, technology
- Critical capacity to utilise existing research appropriately, including that from overseas

C. Informing policy and product development
- Improved information bases on which to make policy decisions: research findings can be used to develop new policy, change policy or maintain existing policy
- Feeding research findings into product and technology development efforts (eg science commercialisation)

D. Health and health sector benefits
- Increased effectiveness of healthcare provision leading to improved population health
- Cost reduction in the delivery of existing services
- Qualitative improvements in the process of service delivery
- Improved allocation of healthcare resources, better targeting and accessibility, issues of healthcare equity

E. Broader socioeconomic benefits
- Economic benefits from a healthy workforce
- Economic gains associated with science commercialisation and innovation

16.3.1 Categories of benefits (Payback) and associated indicators

In the context of health research, within which the Payback framework has most commonly been applied, the framework considers five categories of benefits, or paybacks: knowledge production; benefits for future research and research use; informing policy and product development; health and health sector benefits; and broader socioeconomic benefits. Box 16.1 summarises the various benefit categories and their components. Box 16.2 highlights some of the indicators that can be used to assess each category.

Box 16.2: Some indicators of potential benefits from research (within a Payback framework category)

A. Knowledge production
- Number of publications from the research
- Bibliometric measures (based on citation analyses)
- Patent data

B. Benefits for future research: research targeting and capacity building
- Citation analysis indicates influence of research on future studies
- Information on funding sources and grant sizes can be useful for securing finance for follow-on studies
- Numbers of researchers trained and empowered through the research (eg higher degrees, professional promotions)
- Evidence of new or improved research infrastructure (eg equipment, facilities)

C. Informing policy and product development
- Research cited in policies and guidelines
- Researcher advisory roles on policy panels
- Research cited in patent claims
- Licensing out intellectual property rights
- Number of products receiving regulatory approval
- Contract research work for industry
- Joint ventures
- Inputs into private enterprise creation (eg founding or advisory roles)

D. Health and health sector benefits
- Quality and Disability Adjusted Life Years
- Reductions in visits to doctors and hospital days
- Changes in mortality and morbidity statistics
- Evidence of cost savings for the health sector
- Evidence of quality gains in service provision

E. Broader economic benefits
- Science commercialisation: profits resulting from the exploitation of intellectual property, spin-off companies and licences
- Revenue gains and/or cost savings resulting from export and/or import substitution attributable to an innovation from the research
- Human capital gains (eg reduction in productivity loss through illness or injury due to innovations from the research; new employment opportunities resulting from the exploitation of research findings)

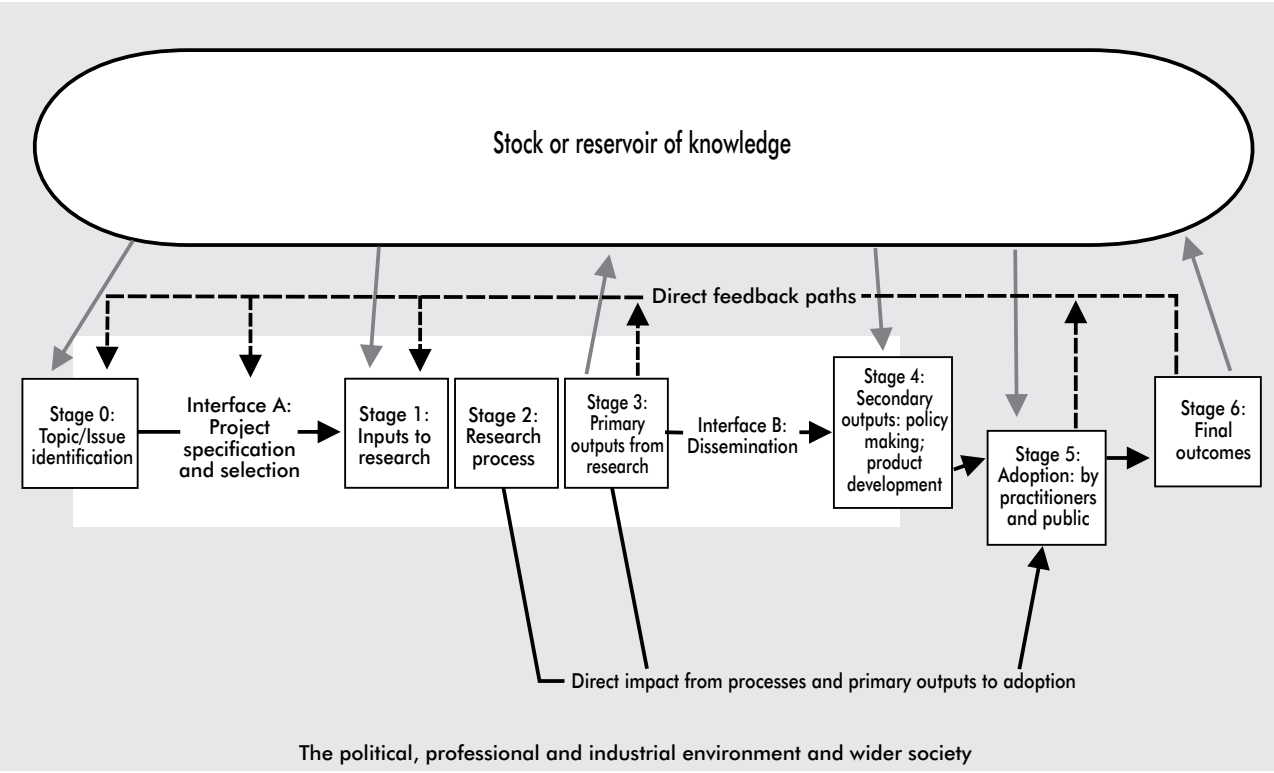
16.3.2 The logic model in the Payback framework

The second element of the Payback evaluation framework is the logic model (Figure 16.1). The logic model describes various stages and interfaces in the process through which research can generate impacts, including: research topic identification; project specification and selection; inputs into research; the research process; primary outputs from research; dissemination; secondary outputs (the impact of research on policymaking and product development, the adoption of research findings by practitioners and the public); and final outcomes. The logic model can serve as a roadmap for conducting research evaluations. The phases of the model also enable an evaluator to examine whether and how input, process and output and/or outcome variables relate, which is important for informing future research strategies.

The reality of research processes is likely to be more complex than presented in the logic model, and there is likely to be considerable feedback between various stages: the logic model *helps facilitate assessments* of research impact through time, rather than pretending to be a precise model of how research utilisation occurs.

Box 16.3 summarises the key elements of each stage in the logic model that can be examined during a research evaluation.

Figure 16.1: The logic model in the Payback framewor



Source: Hanney et al. (2004)

Box 16.3: A summary of issues to consider in evaluations, within each stage of the Payback logic model

Stage 0: Topic/issue identification
- Examine how the idea for the research was born. Various drivers can exist (eg researcher's intellectual curiosity and interest, a known need in the research community, a solicited call for the research).

Interface A: Project specification and selection
- Examine the nature of proposal development (eg individual, team) and the peer review process, including potential modifications to a proposal post-review.

Stage 1: Inputs into research

Examine the resource inputs into a project (eg financial resources, human resources, physical resources, collaborators).

Stage 2: Process
- Consider key factors that can affect the research process (eg the appropriateness of the research design and methods for answering the scientific question; the difficulties or challenges encountered during the research; facilitating or impeding factors; research efficiency; interactions with the potential users of the research; any potential early research dissemination or adoption activities occurring as milestones are reached).

Stage 3: Primary outputs from research
- Consider the following payback benefit categories: knowledge production *(category A),* and benefits for future research – research targeting and capacity building (*category B).*

Interface B: Dissemination
- Identify types of dissemination mechanisms (eg conference papers and presentations; seminars; audience-specific briefs; personal networking for research knowledge exchange; education activities; interactions with the media – usually more active than the mere production of academic publications).
- Consider the time-scales over which dissemination occurs (during and after project work completion), the levels of geographic and sectoral outreach.

Stage 4: Secondary outputs – policymaking and product development
- In assessing secondary outputs, focus predominantly on research contributions to informing policy and product development (*benefit category C*).
- Research findings can be used in various ways (eg to develop new policy, change policy or maintain existing policy), across different levels of the system, and with varying degrees of impact.

Stage 5: Adoption by practitioners and public
- Adoption of research findings is central to their translation into health and socioeconomic benefits.
- Consider behavioural changes (eg by practitioners, the public).
- Examine adoption or take-up rates.
- It is important to explore how far a behavioural change can be attributed to the specific research findings, as opposed to other factors (such as a more general change in climate)

Stage 6: Final outcomes
- The stage when health and health sector benefits (*category D*) and broader socioeconomic benefits (*category E)* surface and can be examined.

16.4 When to use the Payback framework for research evaluation

Other methodological frameworks have been adopted in evaluation research, but few are as comprehensive and multidimensional as the Payback model[1]. Brutscher et al. (2008) suggest that the choice of an appropriate research evaluation framework is influenced by the evaluation objectives, the measures to be used for assessing research outcomes, the level of aggregation, and the timing of the evaluation[2].

16.4.1 The Payback framework and evaluation objectives

Buxton and Hanney (1996) identify three main reasons for undertaking an evaluation with the Payback framework:

The Payback framework has most commonly been used to justify spending resources on health research; to assist with the prioritization of future expenditure, and to indicate ways to improve the conduct and management of research so as to increase the likelihood or magnitude of subsequent beneficial consequences.

16.4.2 Measures used in the Payback framework

The benefit categories and measures used in the payback framework were summarised above.

The Payback framework should be used when evaluators want to consider input, output, outcome and impact measures in their evaluations of research.

The Payback framework considers a diverse range of measures for assessing the benefits from research, including *input measures,* which capture the resources consumed (eg physical, financial and human resources, collaborations); *output measures*, which capture the direct results of the research (eg publications, patents, career development outputs); *outcome measures*, which reflect the initial impact of research (eg impacts on policy and product development); and *impact (final outcome) measures*, which capture longer-term impacts (eg broader socioeconomic benefits). A range of methods can be used to assess individual research output categories, as well as a number of indicators.

16.4.3 The Payback framework and levels of aggregation

The level of aggregation in an evaluation can be (i) *low* (individual researcher, research group or research project), (ii) *intermediate* (faculty or research programme) or (iii) *high* (research discipline, research council, charity, industry or university).

The Payback framework is most suitable for low (individual researcher, research group or research project/grant), and intermediate levels (faculty or research programme) of aggregation.

The Payback framework is generally implemented through case studies and concentrates not only on assessing the benefits from research, but also on understanding the process through which the research and its benefits unfolded, and the variables integral to the process. This allows the logical flow between inputs, outputs, outcomes and impacts to be captured and investigated in detail. However,

1 For a review of various evaluation frameworks see: Brutscher et al. (2008).

2 In addition, the authors suggest that the choice of objectives influences the measures used for assessing research outcomes, which in turn influence thinking about the right level of aggregation and timing. In addition, the choice of the level of aggregation influences the choice of methods used.

using the Payback framework for evaluations at high levels of aggregation would be very time consuming and costly. Evaluations at higher levels of aggregation tend to adopt macroeconomic and/or microeconomic modelling, and/or productivity analyses that focus less on process, and more on outcomes. This is not to say that such modelling methodologies could not be applied to a Payback framework-based evaluation, but they have not been to date. Other frameworks exist for higher levels of aggregation (eg research discipline, research council, charity, industry or university)[1].

16.4.4 The Payback framework and the timing of an evaluation

The timing of an evaluation relates to the time interval between the completion of the research and evaluation.

The Payback framework has been applied and is suitable for both cross-sectional and longitudinal evaluations, and can be used at various times after primary research has been completed.

Timing considerations in evaluations based on the Payback model have varied across applications. For example, the Payback evaluation conducted for the Arthritis Research Campaign (Wooding et al., 2005) covered impacts 10–12 years after the completion of examined research. Project Retrosight – an examination of the returns from cardiovascular research in three countries – covered a period of 10–20 years after the completion of research projects. On the other hand, the evaluation of the ESRC Future of Work programme looked at the benefits from research projects over a shorter time frame (3–6 years following completion of the research).

Lastly, it is worth noting that not all categories of the Payback framework will apply equally (in terms of relevance) across diverse research types. For example, when evaluating the outcomes from basic science research in a healthcare context, knowledge production outputs are likely to be more relevant than outcome measures such as informing policy (at least relative to clinical research). At a minimum, longer time frames are needed to study the contributions of basic research to more downstream outputs and socioeconomic impacts.

16.5 How to use the Payback framework

The Payback framework is implemented through case studies.

Gathering evidence: The case studies are based on multiple sources of evidence, which all feed into deriving conclusions from an evaluation, and are used to test confidence in the conclusions. The main sources of evidence include grey and peer-reviewed literature and archival documents, semi-structured key informant interviews, which can also be complemented by surveys, and bibliometric analysis. Anecdotal evidence suggests that those being evaluated (by and large) agree with the evaluation outcomes.

Write-up of case-study narratives: When evaluating the payback from research, the first step in the analysis process generally involves writing up case study narratives. The core categories (phases) of the Payback logic model serve as themes when organising the case study write-ups. They ensure a requisite level of

1 These include the Vinnova framework of the Swedish government agency for innovation systems; the UK Department for Innovation, Universities and Skills (DIUS) evaluation framework; and the European Commission Framework Programme 7 evaluation framework.

consistency in data reporting across individual case studies.

Comparing and synthesising data from multiple case studies: There are a number of techniques that can help triangulate data from multiple case studies. They include coding and scoring case study data to assist in comparisons, and drawing inferences from the broader outputs and impacts of projects/programmes, in addition to expert workshops.

A coding scheme can be developed to provide a way of facilitating cross-case data comparison. The coding process helps capture and organise data that emerges from the investigations. It is in essence a way of enabling the quantitative representation and comparison of qualitative evidence. This is an important step towards the abstraction and prioritisation of overarching policy relevant themes and the more salient features influencing research processes and their impacts. The key categories of the Payback logic model, and the associated questions explored in interviews, can serve as coding themes. Each coding category should be designed in a way that minimises the need for investigator judgement, and ensures that the coded data is an objective feature summary of each case.

Scoring projects described in the case studies on a series of dimensions that reflect the Payback benefit categories can be generated through a consensus scoring technique that provides a means of collapsing the complexity of the case studies to produce "summary output statistics". Scoring can help towards making sense of outputs, against the types of research conducted and against the variables influencing research processes.

Drawing conclusions: A study team can then review the narrative case studies and the cross-case analyses of coded and scored data to extract recurring themes and explore the links and potential contradictions across cases. The strength and resilience of themes can be assessed, and grouped and prioritised accordingly. Attention should also be devoted to ensuring that pertinent data is not omitted from analyses, including considering "outlier" (eg more rare) themes or variables that may be particularly important for a distinct type of research or organisational context.

A final step in the evaluation of research using the Payback framework can involve the triangulation of empirical evidence against the broader policy and institutional context within which the investigated research occurred (during a study timeframe). *Expert workshops* can assist in the process. They allow a study team to test and discuss the findings and inferences from the evaluation against the contextual, specialised knowledge of experts, and to consider the implications of the findings from an evaluation in more detail – through a participatory and stakeholder inclusive research approach.

16.6 The Payback framework in action

The Payback framework has been applied in a number of different contexts. Buxton and Schneider (1999) explored applying it to a Canadian research organisation that funded basic biomedical and early clinical studies, alongside health services research[1]. The model has also informed analysis of health research systems on behalf of the World Health Organization (Hanney et al., 2003; Pang et al., 2003). It has most recently been used in assessments of the payback from Health Technology Assessment programmes in the UK (Hanney et al., 2007) and the Netherlands; to explore

1 Prior to this, the framework was generally applied to health-service research in the UK context only.

the payback on arthritis research funded by the Arthritis Research Council (Wooding et al., 2004, 2005, Wooding et al., 2005) and the research of the Irish Health Research Board (Nason et al., 2008), and to investigate the payback on cardiovascular disease research in three countries (Australia, Britain and Canada), and the pathways through which this payback is generated (i.e. Project Retrosight).

Increasingly, other researchers are also applying the Payback framework to assess programmes of research in the UK and internationally. These include studies of the full range of health services research funded by the Alberta Heritage Foundation for Medical Research (AHFMR, 2003); the full range of basic and clinical research funded in Catalonia by the TV3 telethon (Berra and Pons, 2006); the range of health services research in the UK funded by the Service Delivery and Organisation programme (Peckham et al., 2006); examples of primary care research in Australia (Kalucy et al., 2007); and the full range of research funded by the Health Services Research Fund of Hong Kong (Kwan et al., 2007).

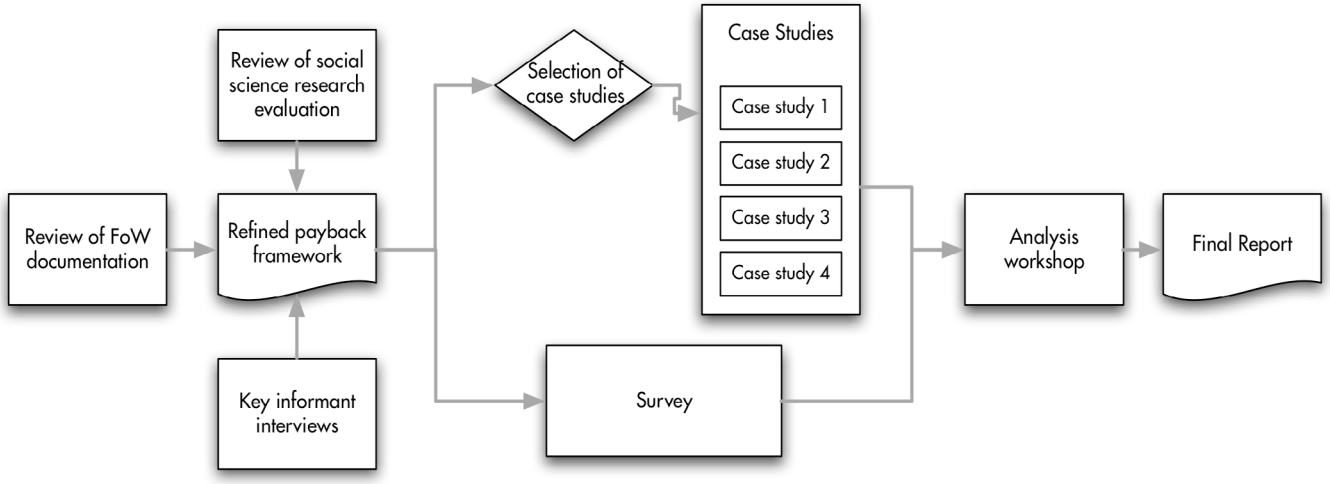
The Payback framework is adaptable, and has also been successfully applied outside of health-related research contexts, such as in the social sciences. One example is the evaluation of a social science research programme of the Economic and Social Research Council (ESRC) (Nason et al., 2007). Over the past decade, a culture of accountability had grown around government spending. This climate led ESRC to investigate the most effective ways to evaluate social science research and demonstrate the wider impact of its research on society. RAND Europe examined how the ESRC Future of Work (FoW) programme (which investigated future prospects for paid and unpaid work in the UK) influenced policy and professional practice. The programme's goal was to provide evidence-based research to help policymakers, practitioners and researchers interpret the changing world of work in an era of rapid social, technological and economic change.

RAND Europe carried out four *case studies* to explore the wider impacts of selected research projects within the FoW programme, using the Payback framework. The *data sources* used in each of the case studies included: the grant application, peer review comments on the grant, the Programme Director's final report; papers and publications attributed to the grants, survey data, face-to-face interviews with PIs, telephone interviews with other researchers associated with the grant; telephone interviews with policy and practitioner users; initial key informant interviews and reviews of relevant policy documents.

Evidence from the cases studies was compared and synthesised to make inferences about the impact of the programme. An *analysis workshop* was then conducted, and brought together the project team and an ESCR project manager to discuss the findings and jointly reflect on emergent themes.

The project schematic adopted in evaluating the FoW programme is summarised in Figure 16.2.

Figure 16.2: Project schematic



Source: Wooding et al. (2007)

For the purposes of this project, the benefit categories of the Payback framework were adapted to a social science context. For example, health and health-sector benefits *(benefit category D)* were not considered, and the wider socioeconomic benefits *(benefit category E)* considered factors such as social or economic effects that change society (including impacts on public opinion and media coverage as proxy for public opinion), rather than health sector related socioeconomic benefits. Box 15.4 summarises the Payback benefit categories adapted for the evaluation of the FoW projects[1]. The logic model element of the Payback framework, used to capture the research narrative, could be effectively applied without modification.

Box 16.4: Revised Payback categories for social science

A. Knowledge production
B. Benefits for future research and research use
C. Impacts on policy
D. Impacts on practice
E. Wider socioeconomic benefits

Source: Adapted from Wooding et al. (2007)

The Payback evaluation showed that the FoW programme had significant impacts on: knowledge and research (in the form of publications, presentations and changes in relevant fields of research); policy (through seminars, networking, informing policy debates and contributing to policy formulation); and the career development of FoW programme researchers (including network formation and promotions). Adopting the range of data sources and methodologies outlined in Box 16.4 allowed RAND Europe to identify a range of benefits from research within the FoW programme.

The benefits from research (in each of the four case-studies conducted) are summarised in Table 16.1 below.

16.7 Summary

There are a number of reasons for evaluating research. These include ensuring transparency and accountability for research spend, advocacy purposes, to help steer research processes towards desired outcomes, and to assist in the management of research processes through learning from past experience.

1 In modifying the health-related categories, RAND Europe chose to generalise them rather than to alter their specificity to relate to employment. This was done because the project was the first time the applicability of the Payback framework to the social sciences in general was being examined, using the employment sector as a test case. This raises the issue of whether it may be useful to classify impacts by whether they fall within the same sector as the research: health in our initial work, employment in this work. In this project, RAND Europe wished to explore wider impacts in as general a sense as possible, so chose not to make sector distinctions.

Table 16.1: The payback from research in case studies of the Future of Work programme

	Case study A	Case study B
Knowledge production	▪ Three peer-reviewed papers (more forthcoming) ▪ Three further academic papers commissioned by the PI within government ▪ Four book chapters, one book ▪ 25 presentations to academic audiences	▪ 12 peer-reviewed papers ▪ Book chapter for *Managing labour in small firms* ▪ Six presentations to academic audiences
Research targeting	▪ Ongoing dialogue with other researchers in FoW ▪ Ongoing debate about agency/ constraint in women's employment decisions ▪ Interdisciplinary contribution to PI's academic research ▪ Constructive academic-policy crossover affecting policy; policy needs feedback into PI's research of findings	▪ Research method recognised by DTI as the most appropriate for studying small firms ▪ Successful ongoing collaboration between PI and senior researcher ▪ Follow-up research for the LPC, DTI, Work Foundation and ESRC ▪ Researcher career advancement and achievements (eg OBE) ▪ Informed research on the minimum wage in Manitoba, Canada
Impacts on policy	▪ White Paper on Work and Families (2003) ▪ Work and Families Bill (2003) ▪ Key Indicators of Women's Position in Britain (2003, 2005) ▪ Women and Work Commission Report (2006) ▪ Green Paper on Work and Parents ▪ Various EOC documents on work and families, 2001–2006 (10 cite PI) ▪ Five non peer-reviewed articles and numerous presentations to policymakers	▪ Report to LPC providing evidence on the NMW ▪ Informed policymakers at the DTI and LPC about the situation in small firms ▪ One case study organisation was investigated in a LPC review ▪ Helped the ERD at DTI to understand the situation with small firms in the UK ▪ Graduate course content is now different ▪ One non peer-reviewed article and a presentation to policymakers

Source: Adapted from Wooding et al. (2007)

	Case study C	Case study D
	▪ Three peer-reviewed papers ▪ One management book of Phase II ▪ Upcoming academic book ▪ A forthcoming book chapter ▪ Over 16 presentations to academic and non-academic audiences	▪ Nine peer-reviewed papers ▪ 14 book chapters ▪ One upcoming book by the PI and two of the researchers ▪ 17 presentations to academic audiences
	▪ Formed new collaboration between research groups ▪ Foundation for grant in Phase II ▪ Other researchers' publications citing papers from the project ▪ Data set used for additional work by team and available to other researchers in ESRC archive	▪ Installation of the PI as Chair of the TUC Partnership Institute Advisory Committee ▪ Further research by the PI and others on the grant would not have occurred without FoW ▪ Career progression of academic lawyer on team ▪ Creation of new researcher networks for the PI and research team members
	▪ Informed Health and Safety Commission work on work-related stress and work–life balance ▪ Use by Work Foundation relating to job satisfaction ▪ Reinforced the policy line of the CIPD ▪ Equal Opportunity Commission research drew on the project work ▪ One organisation changed its policy regarding junior staff workloads, the behaviour of managers, and the structure of the career ladder ▪ Four non peer-reviewed articles and numerous presentations to policymakers	▪ Referenced in House of Lords Judgement ▪ Input into an employer–union deal with a major UK employer ▪ Movement of the junior researcher into ACAS ▪ ACAS taking on board the results of Phase II ▪ DTI, Work Foundation and TUC claimed the work had shown the 'lie of the land' ▪ Two researchers submitted evidence to DTI review of the Employment Relations Act 1999 ▪ Reports to the ILO and Labour Relations Commissions Review ▪ 12 non peer-reviewed articles, 6 presentations to policymakers

Continues

Table 16.1: The payback from research in case studies of the Future of Work programme (continued)

	Case study A	Case study B
Impact on practice	▪ The "planning finding" taken up by various corporate practitioners to negotiate decisions around maternity leave and return to work ▪ Contribution to discussions on introduction of paid paternity leave	▪ Informed small firm owners/ managers of the likely impacts of the NMW, but difficult to know if they changed behaviour due to that information.
Wider social and economic benefits	▪ Six articles in local and 11 articles in national newspapers, numerous magazine articles ▪ Four radio interviews ▪ One BBC TV appearance ▪ Reduction of gender segregation and pay gap if flexible working available for women returners	▪ No media outputs registered ▪ Impossible to attribute any socio-economic benefits to the project

Source: Adapted from Wooding et al. (2007)

Over time, a number of research evaluat000ion frameworks have been developed and serve as guides for conducting research evaluations. This chapter discussed the Payback framework, its purposes, when and how to use it. Payback is a tool for evaluating a comprehensive range of potential outputs and impacts from research and (unlike many other research evaluation frameworks) also provides a way of conceptualising the *process* through which outputs are created (ie the logic model).

As with all research evaluation frameworks, caution needs to be exercised by evaluators when attributing impacts of research to a person, grant, project or programme. Approaches such as bibliometric analysis (citation analysis) have attempted to assist attribution efforts. However, when (as is generally the case) a product, policy change or socioeconomic impact is generated through contributions from diverse research projects over time, attribution is by no means straightforward.

16.8 Further reading

Arnold, E. and P. Boekholt, "Measuring 'relative effectiveness'". In Boekholt, P., *Innovation Policy and Sustainable Development: Can Innovation Incentives make a Difference?* Brussels: IWT Observatory, 2002.

	Case study C	Case study D
	▪ Research was discussed with advisory group; could have led to changes in practice by members ▪ Research was fed back to study organisations; could have led to changes in practice in studied organisations	▪ Research was fed back to study organisations as part of the clearance process, but there are no known practice impacts from this ▪ The way a major UK employer conducted itself in the negotiations of a new partnership deal
	▪ Increased awareness of workplace issues and equality through extensive media coverage (use of findings by FoW media fellow; 20 articles in national and 50 in local newspapers 15 in magazines and features in TV) ▪ Impossible to attribute any socio-economic benefits to the project	▪ Three pieces in local newspapers about the Phase I research. ▪ Three items in magazines (trade press) ▪ Impossible to attribute any socio-economic benefits to the project

CHAPTER 17
Process mapping *Jan Tiessen*

17.1 Key points

- Process mapping is a tool for graphically representing a series of tasks or activities that constitute a process.
- Process mapping enables better understanding of the process examined, including gaps, bottlenecks and other problems.
- Process mapping is particularly useful for visualising and understanding complex processes.

17.2 Defining process mapping

Evaluations in the public sector often involve analysing processes. Processes can be thought of as a series of tasks and activities conducted by one or several actors, which transform a number of inputs into an output, either a service or a good. A common methodology used to support such analysis is process mapping. Process mapping aims to identify all the steps and decisions that occur as part of a process and to produce a graphical representation of that process. Process mapping can be used in an evaluation context as:

- a descriptive tool to create a better understanding of an existing process
- an analytical tool for identifying problems within a process, such as process bottlenecks, redundant process steps and inefficiencies
- a tool to communicate the complexity of a process, the potential for improvement and what an improved process might look like.

In many cases, process mapping will also be a first step before applying more sophisticated analytical techniques, such as activity-based modelling.

The graphical representation, ie the process map itself, can take many different forms. There are at least two broad types of process maps:

- flowcharts, which show the sequencing of activities and tasks performed within a specific process
- process definition charts, which show the necessary inputs and resources for each activity, the resulting outputs, and the controls that are used to direct the process.

17.3 When to use and when not to use process mapping

In principle, process mapping can be used to analyse a wide range of processes in a variety of organisations and settings, ranging from the manufacturing process (eg assembling a car) and service delivery (eg paying out child benefits) to political decisionmaking processes (eg deciding to increase alcohol taxes). Given the resources required to conduct a thorough process mapping exercise, process mapping might best be applied to processes that are:

- client facing – produce a service or product for an external client, eg providing housing benefits or treating a patient
- complex – consisting of many steps and/or involving a multitude of actors that need to interact
- high volume – are repeated often, eg application of unemployment benefits or lottery grants

- standardised – are executed according to some kind of standard operating procedures and are not adjusted ad hoc on a case-by-case basis.

We can expect the improvement potential for these processes to be greater than for processes that are fluid, very flexible and conducted on a case-by-case or ad hoc basis, such as some political decisionmaking processes. While a process map might still help to understand the specific process, and allow us to answer "Who did what when?", it will not be of great value in analysing the process or suggesting improvements, as process steps might not be taken in a similar way again (some process steps might be taken in another order, others might be omitted altogether).

17.4 How to conduct process mapping

Including a process mapping exercise in an evaluation requires a number of steps, of which the actual drafting of the process map is only one. Considerable effort and care have to be devoted to gathering the evidence for drafting the process map. This section will explore six key steps and choices that must be considered when conducting a process mapping exercise.[1]

Step 1: Clarify the objective and define the boundaries of the process to be studied

It is essential to clarify the objective of the process map before starting the research. What will it be designed to do?

- Describe a process?
- Create better understanding of a process?
- Communicate with the people involved?
- Identify problems, inefficiencies and shortcomings of a process?
- Improve a process?
- Value, cost and quantify activities?

The ultimate objective of the process map will influence both the best type of map to produce and the evidence gathering stage.

In addition, the boundaries of the process to be studied should be defined. That means defining a clear starting point (eg receipt of an application for a lottery grant) and end point (eg applicant receives lottery grant). This will help to focus the process map once the drafting begins.

Step 2: Choose a process map type

Common types of process maps are:

- flowcharts (high level , activity level or task level)
- deployment or swim lane flowcharts
- process definition charts
- value stream maps
- data flow diagrams.

Each of these types of process map has specific advantages and disadvantages and allows researchers to answer a specific set of questions. Table 17.1 provides a summary of the key characteristics that need to be considered in choosing the type of process map to use.

1 More detailed guidance can be found in Damelio (1996), Hunt (1996), George et al. (2005) or the excellent summary of the Scottish Audit Commission (Audit Scotland, 2000).

Table 17.1: Choosing a process map

Type of map	Description	Questions	Advantage	Disadvantage
Flowchart	Breaks down a process into sequential steps and decision points; depending on level of analysis high-level, activity level, or task level flowcharts are used	▪ What are the steps of the process? ▪ In which order do they occur? ▪ When are decisions taken?	▪ Intuitive way of presenting a process, thus easy to conduct ▪ Provides a very good overview of a process ▪ Allows identification of redundant process steps	▪ Can become very tedious if high level of detail ▪ Requires very high level of process knowledge
Deployment flowchart	Breaks down a process into sequential steps and decision points; highlights the role of different actors in a process	▪ What are the steps of the process? ▪ In which order do they occur? ▪ When are decisions taken? ▪ Who is involved in the process?	▪ Makes it easier to suggest the department which needs to make changes ▪ Allows identification of responsibilities ▪ Easy to produce when flowchart is already available	▪ May lose focus on problematic tasks or decisions
Process definition chart	Focuses attention on the context of a process by looking at inputs and outputs, resources and controls	▪ What are the inputs of the process? ▪ What are the outputs of the process? ▪ What resources are needed? ▪ How is the process controlled?	▪ Achieves breadth of a subject matter, discusses also resources and constraints ▪ Includes information about resources and controls; integrates the context into the process	▪ Approach less intuitive ▪ Difficult to pinpoint what is driving down value in a system
Value stream map	Adds information attributes such as time and costs to the analysis of processes	▪ How much does a process step cost? ▪ What parts of a process add value? ▪ What parts of the process adds costs? ▪ Where do delays occur in the process?	▪ Allows quantification of process improvements ▪ Collects a wide range of information	▪ Conceptually complex ▪ Resource intensive
Data flow diagram	Shows the flow of data through a complex system	▪ How are processes / activities linked? ▪ How does the data flow through an IT system? ▪ Where and when is data stored?	▪ Improves understanding of how data is managed ▪ Shows how sub-processes are interconnected	▪ Very little information about the processes and activities themselves

Source: RAND Europe

Step 3: Conduct fieldwork

The type of process map determines the type and amount of information that should be collected during fieldwork, which in turn influences the methods used during the fieldwork. The information required for each map type is listed in Table 17.2.

To gather this information, a number of research methods might be considered. In conducting a process mapping exercise it is essential to capture the actual or "as is" process rather than an idealised "should be" version of it. It is thus recommended that several research methods are used to triangulate findings. To gather the evidence needed, well-known qualitative research methods can be applied, such as:

- document analysis
- key informant interviews
- focus groups /workshops
- process observation.

For a typical process mapping exercise, the analysis might start with reviewing available documents to get a basic understanding of the process, before conducting an observation or walk through of the process and supporting interviews with key staff, such as product/service managers, desk officers, support staff, etc.

In gathering evidence, it is important to engage people from all involved units in an organisation and all involved organisations, as well as staff from different organisational levels. Observation can be considered the

Table 17.2: Types of information collected in different map types

Type of map	Information required
Flowchart and deployment flowchart	**Basic process information** ▪ What starts the process? ▪ What are the key steps/tasks of the process? ▪ In which order are do these steps occur? ▪ When are decisions taken? ▪ Who is involved in each step?
Process definition chart	**In addition to the above:** ▪ What are inputs and outputs of each process step/task? ▪ What are the resources needed to perform a process steps/task? ▪ Who/what controls the process steps/tasks, and how? ▪ What are the constraints of the process/tasks?
Value stream map	**In addition to the above:** ▪ How long does it take to complete the process step/task? ▪ What is the overall length of a process step/task? ▪ What are the costs associated with the step/task? ▪ Does the step add value to the product/service? ▪ How does the information flow through the production process? ▪ How do materials flow through a production processes?
Data flow diagram	**In addition to the above:** ▪ How does data flow between different process steps? ▪ Where and when is data stored in a process?

Source: RAND Europe

Table 17.3: Methods for gathering evidence

Method	Advantage	Disadvantage
Document analysis	▪ Quick to conduct ▪ Few resources required ▪ Little audit burden for analysed organisations	▪ Danger of capturing an idealised process rather than the actual/real process in the organisation ▪ Does not allow capturing views of employees and managers of potential problems in the process
Key informant interviews	▪ Allows in depth discussions with people involved in the process ▪ Allows gathering of individual views on process ▪ Helps identify problems of the process through close interaction with staff	▪ People usually can't provide accurate assessments of time frames taken to complete tasks ▪ Relatively resource intensive
Focus groups / workshops	▪ Very interactive ▪ Help build consensus around the process maps very early ▪ Fewer resources needed than for interviews	▪ Some members of staff might not speak up openly if different levels of hierarchy are present at workshop ▪ Do not allow for a very detailed discussion of tasks
Process observation	▪ Allows the researcher to experience the real process ▪ Allows the collection of data, eg on time taken, as process moves on	▪ Resource intensive ▪ High audit burden

Source: RAND Europe

methodological gold standard for process mapping; however, time and resource constraints might mean that a less resource-intensive approach must be used. 17.3 provides an overview of available methods and their advantages and disadvantages. More details about how to execute some of these methods can be found in the other chapters of this handbook.

Step 4: Produce and validate a draft process map

Once the evidence about the process to be mapped has been collected, drafting can begin. Drafting a process map is usually done in two stages:

- production of a first, brown paper draft
- validation meetings.

In the first stage of drafting, an outline draft of the process is produced by first listing all the steps identified, and then sequencing the steps according to the information retrieved. A common method for this is to use a whiteboard or large piece of brown paper, and attach Post-it® notes to it, each note representing a process step.

When the draft map is satisfactory, validation meetings should be arranged with a selection of staff from the organisation(s) being analysed. These meetings are held to correct the map and agree on the final process map by asking whether steps are in the right order, whether all steps have been depicted and whether responsibilities for each step have been recorded accurately.

Step 5: Draw the process map

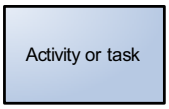
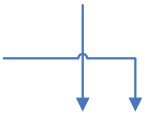
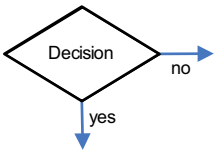
With the draft process map agreed, the final process map can be drawn. Different types of process maps follow different drawing conventions. Three of the most commonly used process mapping types are:

- flowcharts
- deployment flowcharts
- process definition charts.

Drawing a flowchart

Flowcharts are distinguished according to the level of analysis – high, activity or task. The deployment or swim lane flowchart is a special way of arranging a flowchart. All these flowcharts use a small set of standardised symbols to illustrate main process steps and show the flow of the process. Table 17.4 shows the most common process mapping symbols.

Table 17.4: Standard flowchart symbols

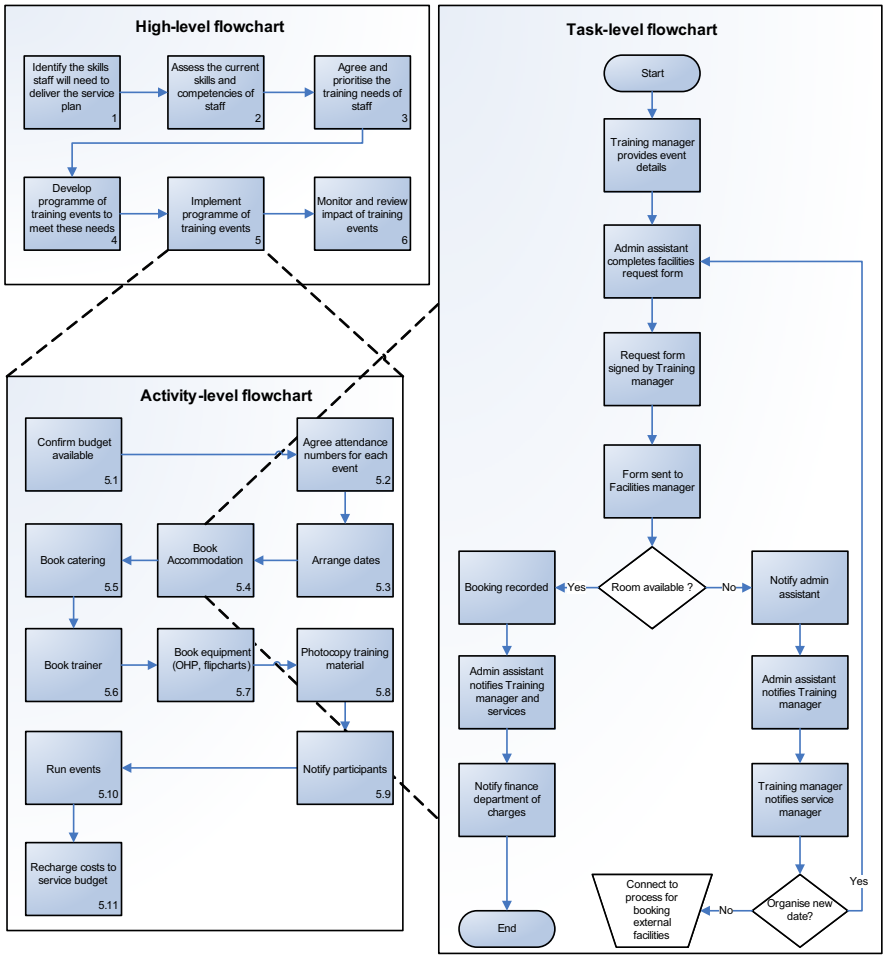
Symbol	Use
	The **activity or task rectangle** is one of the most central elements of the map. It represents a step in the process in which an action is taken (ie send application, sign off on budget, etc). The generally accepted methodology for wording in the boxes is to enter a *verb + noun*
	**Arrows** are used to indicate the flow of the process. Arrows should not intersect but pass over and under each other to ensure you can trace the process accurately.
	A **diamond shape** is used to illustrate **decision points**. There are two ways of continuing – one direction for a *yes* answer and another for *no*. It is important, therefore, to write the question in the decision diamond in such a way that it can be answered with a simple yes or no. Then, arrows can extend towards the corresponding step in the process. If your map flows top down it is convention to let the yes arrow point down; if your map flows from left to right it should point right.
	A **terminator** is used in task level flowcharts to identify the start and end point of a process, eg *application received* as a start point and *payment made* as the end point.

Source: RAND Europe

These symbols are used to draw the process map. A single box is used for each step of the process, labelled with a *verb + noun* combination (eg check eligibility; stamp letter, etc) and boxes are connected using arrows. The decision and terminator symbols are commonly only used in task level flowcharts.

Figure 17.1 below shows examples of high-, activity- and task-level flowcharts. It also illustrates how different levels of flowcharts can be used to describe a process at different levels of detail. In this case, the high-level flowchart outlines a process to improve staff skills through training. One of these steps, the implementation of a training programme (step 5), is then outlined in more detail using an activity-level chart. One of the activities of the implementation is to book accommodation for a training course (5.4). This activity is now broken down again into activities, using a task-level flowchart.

Figure 17.1: Examples of high-, activity- and task-level flowcharts for a process of assessing staff skills

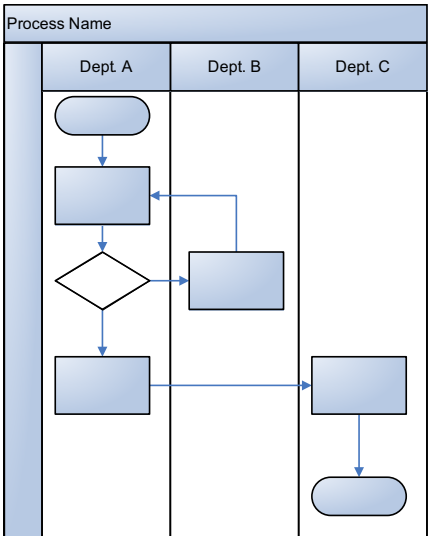


Source: Adapted from Accounts Commission (2000)

Drawing a deployment flowchart

A deployment flowchart focuses on the interaction between and the responsibilities of different actors in a process. It uses the same symbols, but arranges the steps in functional bands or swim lanes. So in the final chart, all actions of the same actor will be in the same column or row, depending on the orientation of the chart. The process flow will now criss-cross between the functional bands. Figure 17.2 below shows how transforming a task level flowchart into a deployment flowchart would look.

Figure 17.2: Example of a deployment flowchart

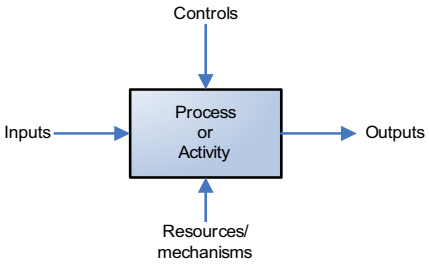


Source: RAND Europe

Drawing a process definition chart

Process definition charts differ from flowcharts by focusing on the inputs and outputs of a process, as well as taking into account the resources needed and the controls active in a process. Process definition charts are graphically very simple and only consist of boxes that describe the process or activity, and a set of arrows that indicate the influences on this process, as shown in Figure 17.3.[1]

Figure 17.3: Terminology of process definition charts



Source: RAND Europe, based on IDEF0 standards

The **rectangular box** represents an activity or process, and is labelled using a verb/verb phrase.

- **Arrows** represent different aspects of the process depending on where they enter/leave the box: **Arrows entering the left side of the box are inputs.** Inputs are transformed or consumed by the function to produce outputs.
- **Arrows entering the box on the top are controls.** Controls specify the conditions required for the function to produce correct outputs.
- **Arrows leaving a box on the right side are outputs.** Outputs are the data or objects produced by the function.
- **Arrows entering the box at the bottom are resources or mechanisms.** These are some of the means that support the execution of the function, but are not

1 Process definition charts are based on the IDEF0 specifications, which provide very detailed guidance on how to draw process maps (see Draft Federal Information Processing Standards, 1993).

consumed or transformed during the process.

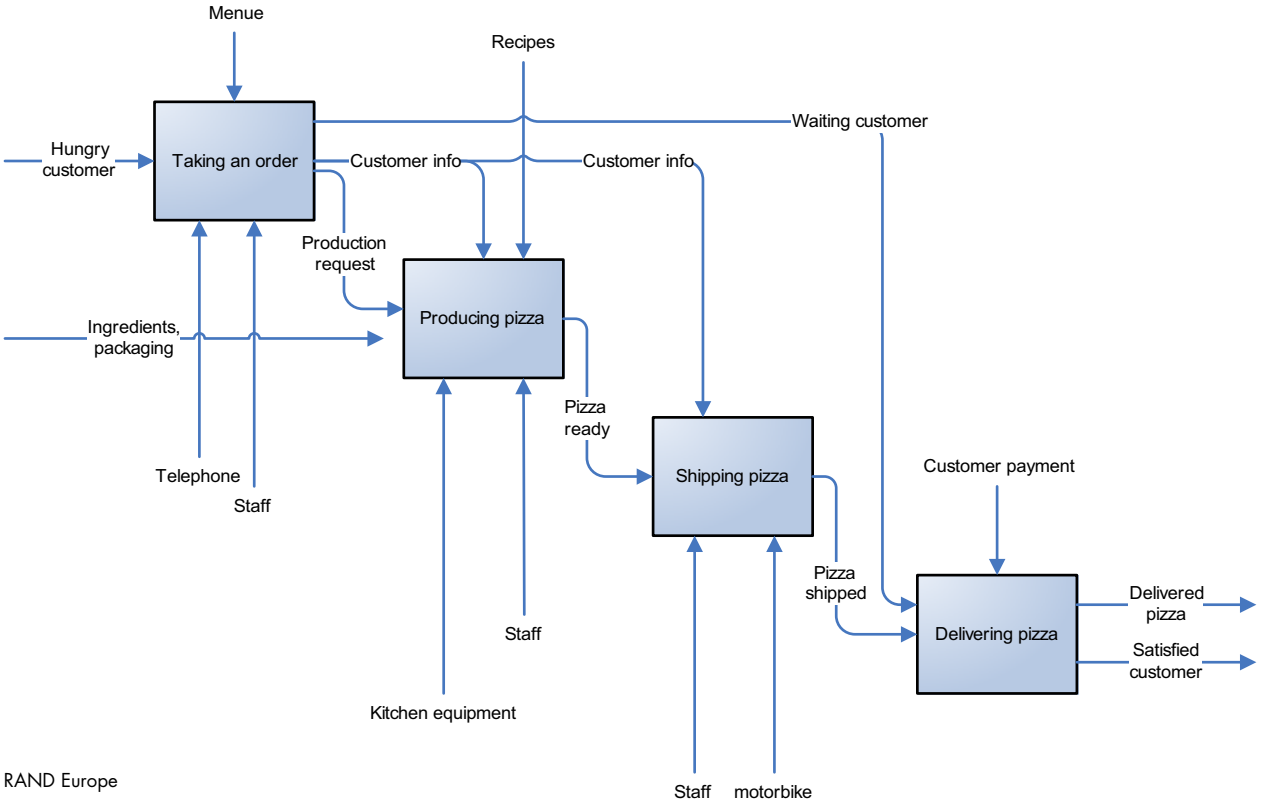
The basic concept of process definition charts is that the process/activity box is used to label a *process of transformation of inputs into outputs***.** An un-reviewed document (input) is, for example, transformed through the review process (activity) into a reviewed document (output). This process follows review guidelines (controls) and needs the time of a reviewer (resources).

This basic notation is used to build a process definition chart. A very basic *A0* chart would just comprise a single box and define the whole process. A larger process can, however, also be broken down in a number of sub-processes, each represented by a process box and the respective arrows. Figure 17.4 gives an example of a process definition chart for the process of ordering and producing a pizza for home delivery.

As for flowcharts, process definition charts can also be produced for different levels of detail. In this case, each sub-map would illustrate exactly one box of the parent chart.[1]

1 For details, see Draft Federal Information Processing Standards (1993) or Hunt (1996).

Figure 17.4: Example of a process definition chart (Pizza delivery)



Source: RAND Europe

Step 6: Analysis and reporting

The visual representation of the process being studied can now be used to analyse the process. Some of the worst problems linked to a process often become immediately apparent once a process has been mapped out, but there are also more formal ways of analysing a process. One more structured way, termed critical examination, is described in the Environmental Protection Agency's (2009) process mapping toolkit. It consists of using the primary questions – What, How, When, Where and Who – to first define what is actually happening ("as is" analysis), and then to identify alternatives ("could be" analysis) and to recommend improvements ("should be" analysis). Table 17.5 provides an overview of suitable critical examination questions.

While conducting such an analysis, typical process problems are often uncovered, such as:[1]

- bottlenecks and resulting backlogs
- endless "do-loops" where rework is common
- unclear responsibilities and roles
- delays between steps
- redundant, non-value-adding steps.

The final step of the process mapping exercise is to report the findings, which can be done using different approaches:

- An evaluation approach focuses on the "as is" analysis, laying out the current process and flagging up the problematic aspects.
- The comparison approach is used if the main objective is to improve a process and implement suggested improvements. The process map of the current process is supplemented with a map of how the ideal process should work.
- A benchmarking approach is used if the study included several processes that

1 See also Hunt (1996), Damelio (1996) or George et al. (2005).

Table 17.5: Critical examination questions

	"As is" analysis	"Could be" analysis	"Should be" analysis
PURPOSE What is achieved?	Why?	What else could be achieved?	What should be achieved?
MEANS How is it achieved?	Why that way?	How else could it be achieved?	How should it be achieved?
SEQUENCE When is it achieved?	Why then?	When could it be achieved?	When should it be achieved?
PLACE Where is it achieved?	Why there?	Where else could it be achieved?	Where should it be achieved?
PERSON Who achieves it?	Why that person?	Who else could achieve it?	Who should achieve it?

Source: CPS (2004)

need to be compared against each other. This helps to flag up differences between processes and identify good and best practice.

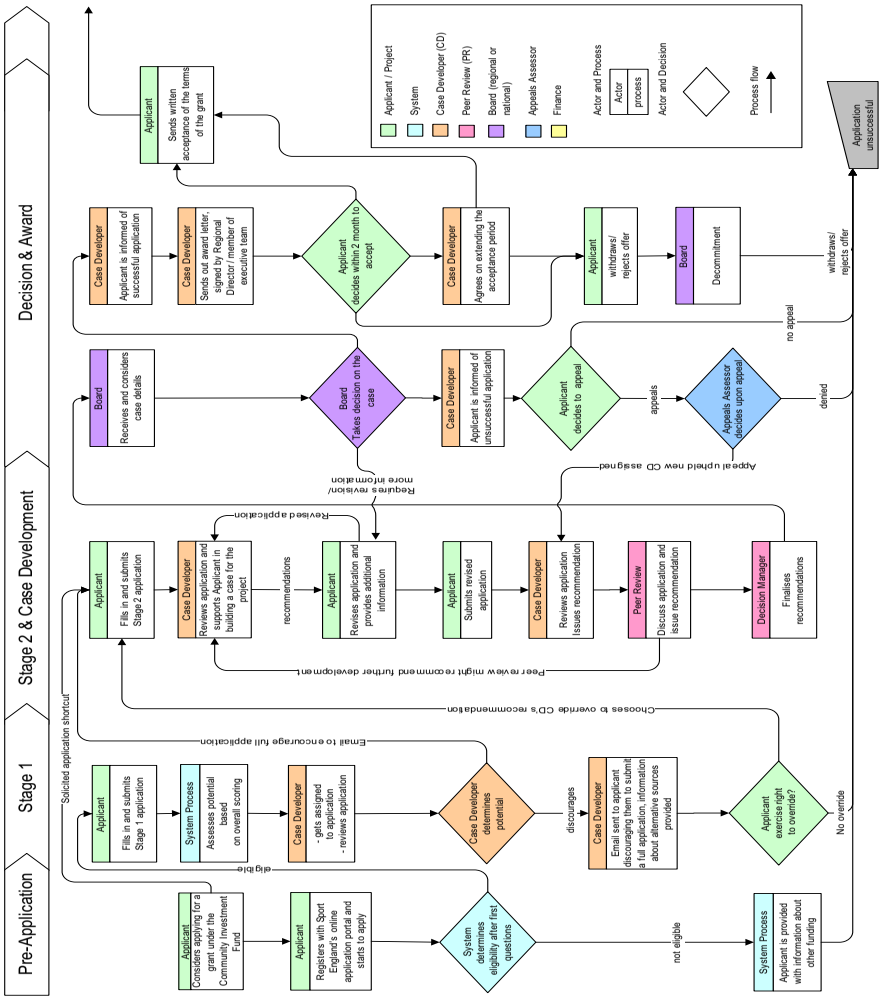
17.5 Process mapping in action: awarding grants in the culture, media and sport sector

In 2008 the NAO, supported by RAND Europe, conducted a study into the efficiency of making grants in the culture, media and sport sector (National Audit Office, 2008). In this study, process maps were used to achieve a better understanding of the processes, to identify key stages of the process, to inform activity-based costing, and to compare different grant programmes. To gather the evidence, the study team reviewed available documentation from the organisations, conducted interviews with the people involved in each step of the process, and validated the findings in collaboration with the audited organisation.

Figure 17.5 shows how a task-level diagram was used to show the tasks involved in the grantmaking process. This map appears rather crowded, as the flow of the process has been drawn both up and down as well as from left to right to capture as much of the richness of the process in as little space as possible. In addition, this map contains more information about actors through marked process boxes and a system of colour-coding.

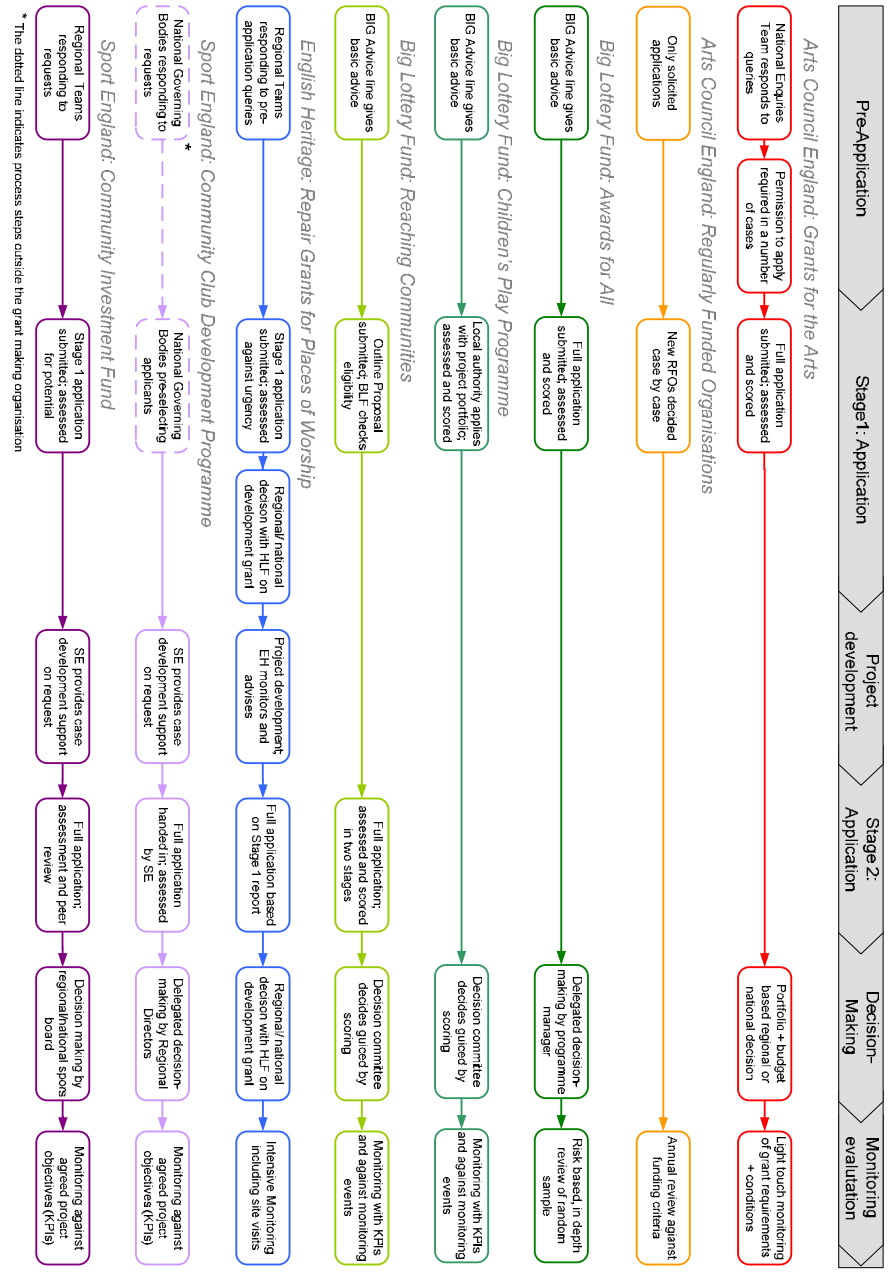
Figure 17.6 shows a second process map from this report, comparing activity level flowcharts. In this map, several grantmaking programmes from various bodies are compared. It can be seen, for example, that some bodies only have a one-stage application process, while others aim to sift out a large number of applicants earlier on in a two-stage process. Some programmes seem to invest more in the applications by also being involved in project development.

Figure 17.5: NAO example of a task-level flowchart of a grantmaking processs



Source: NAO/RAND Europe (2008)

Figure 17.6: Benchmarking processes: NAO study on efficiency of grantmaking in the culture, media and sports sectors



Source: NAO/RAND Europe (2008)

17.6 Summary

Process mapping has been shown in various applications and studies to be a very useful research tool and methodology. It is particularly useful for visualising a process, increasing understanding of complex processes and developing a shared understanding of the status quo.

Process mapping can also be used to show inefficiencies and potential for improvement, in particular if combined with further analysis techniques.

Conducting a process mapping exercise can, however, be resource-intensive and slow. To justify potentially large expenses, it is thus essential to embed process mapping in a well-thought-through research strategy.

17.7 Further reading

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CHAPTER 18
Quantitative techniques in performance audit *Alaa Shehabi*

18.1 Key points

- Quantitative analysis uses data to test a theory, or estimate the relation between a set of variables through an econometric model.
- Econometric modelling can take a macroeconomic or microeconomic dimension; more recent approaches try to combine aspects of both.
- Choice of method and availability and robustness of data are important factors in successful quantitative modelling.

18.2 Defining quantitative methods

The common distinction in evaluation research is between quantitative and qualitative techniques. Increasingly these methods are seen as complements rather than substitutes, and combining both types of techniques to triangulate the research is considered to be good practice.

The drawbacks of qualitative research – difficulty in drawing generalisations from findings, low possibility of independent verification and subjectivity – make it preferable to check if empirical models can be used to quantify the identified impacts. It is important to note that: *"Firstly, not everything that can be quantified is important. Secondly, not everything that is being quantified at present should be, if this cannot be done robustly. Finally, not everything that is important can be quantified: rigorous qualitative research will still be needed for a thorough assessment"* (Mindell et al., 2001). Overall, a mixed method approach to evaluation, which utilises both quantitative and qualitative approaches, is preferable (Rao and Woolcock, 2004).

Quantitative methods are therefore an important part of the armoury of evaluation tools used to assess the systemic and dynamic impacts of policy interventions. Quantified assessments are necessary for economic appraisal or for other explicit trade-offs: some policymakers may give more weight to those outcomes that can be measured (such as traffic levels or estimates of deaths caused by injuries) than to qualitative statements (such as "*access to healthcare will be impeded*") (Joffe and Mindell, 2005).

There are many types of quantitative methods, and they span the statistical, mathematical and econometric disciplines. For evaluation purposes, we are interested in methods and techniques that allow us to empirically assess, validate and evaluate the impacts of a policy intervention, often over time and across populations. Econometric modelling is one of the main quantitative methods employed to do this. Econometric models use empirical data drawn from primary or secondary sources, to test credible *theories* of causality. They can be *dynamic*, ie associated with the understanding of how economic, institutional, social, political and environmental sub-systems interact and evolve over time. Models can be used to extrapolate to the future, or to generalise to other settings.

But causal analysis can pose significant methodological challenges that require innovative techniques to address them. At best we can only estimate causal effects rather

than measure them. For example, the fall in childhood head injuries following compulsory cycle helmet legislation in Australia was at least partly due to decreased cycling rather than to the mechanical protection of helmets. Thus, some health benefits of cycling for the population were lost because of the legislation (Mindell et al., 2001). This poses challenges when trying to estimate the overall effects of the intervention.

A model that can establish cause, effect and the direct impact of the intervention would provide the strongest robust evidence; however, in practice, given the difficulty of tracing and attributing effects, this may be difficult to do. Often, empirical research cannot establish causation and can only establish significant relationships, correlations and associations among variables. One important point to note is that the analysis may need to consider the financing of policies, where the impact of the chosen means of funding must be taken into account. The same is valid for policies triggering expenditure in the private sector, as this might be endogenous to the model itself.

Many of the methodological advances in causal quantitative analysis over the last two decades have been in the field of programme evaluation of labour policies; however, other fields have developed quantitative methods specific to their needs, eg quantitative health impact assessments (HIAs) used in public health and valuation analysis used in transport, among others. We have tried to find a general approach that spans disciplines.[1]

Box 18.1: Causality and the notion of ceteris paribus

The objective of the audit evaluation will often be to infer the causal effect of one variable (eg education, skills and training) on another variable (eg employment). We should never forget that *Association ≠ Causation.* The notion of ceteris paribus (latin for "all other things being equal") plays an important role in scientific inquiry and, specifically, in most economic questions. For example, in analysing demand for housing we are interested in knowing the effect of changing house prices on the quantity of housing units demanded, while holding all other factors – such as income, cost of mortgages, and employment – fixed. The key question in most empirical studies is: Have enough other independent factors been held fixed to isolate the dependent variable and therefore make a case for causality? In most realistic applications, the number of factors that can affect the variable of interest, such as wages or crime rates, is very large and the isolation of any particular variable may seem impossible. However, we can still simulate a ceteris paribus experiment with a well-designed application.

18.3 The range of quantitative techniques

Econometric modelling can take a macroeconomic or a microeconomic dimension, although more recent approaches try to combine aspects of both. Different audit bodies focus on and tend to use different models. The NAO tends to approach the value-for-money question with microeconomic models when evaluating direct and specific

1 We will not discuss the technical aspects of carrying out econometric analysis. The following econometric techniques can be employed in a combined approach as needed; matching, instrumental variables, difference in differences and natural experiments, randomised control trials, estimating structural economic models. These approaches either try to estimate the actual direct impact of policy or try to understand the mechanism of how and why things work in the system as a whole. The use of economic models is thus more ambitious in that it attempts to address the underlying mechanisms.

impacts, rather than relating the intervention to bigger impacts such as social welfare and other aggregate factors that would require a macroeconomic approach. For example, the NAO evaluated the Skillseekers Training for Young People (National Audit Office, 2000) and, through quantitative regression analysis, concluded that the underlying market failure rationale for Skillseekers was valid – that the labour and training markets for young people could be made to operate more effectively.

18.3.1 Macro models

Macro models describe the operation of a national or regional economy, and especially the dynamics of aggregate quantities such as the total amount of goods and services produced, total income earned, the level of employment and the level of prices (Wikipedia, n.d.). They use input factors (such as labour and capital) for a production model to look at issues like maximising social welfare, assessing the opportunity cost of publicly funded services or the management of the macroeconomy itself. The most important elements of macro models are:[1]

- **Data requirements:** aggregated data from national accounts or sector level information.
- **Good for:** evaluating large, economy-wide policies expected to have spillover effects and economic impacts, and where the performance indicators that represent tangible effects are clearly measured and specified.
- **Bad for:** specific local or regional policies that are differentiated across the country. When given, expected effects attributable to specific initiatives are likely to be very small when compared with the total effort invested by the whole economy; general aggregate models are unlikely to be useful for the impact assessment of specific policies (eg impacts of R&D policy).
- **Strengths:** capable of assessing the impact on output, overall employment or employment by sector or region, price levels, productivity.
- **Weaknesses:** the process of model development is data- and resource-intensive and may miss the complexity of interactions and changing dynamic relationships that link the programme inputs with relevant outcome indicators. If building a system model, the process requires large, long-term data sets covering many different indicators. These could only be developed at great cost. Simpler, more general macroeconomic models, eg relating R&D investments with growth, would suffer from the "black box" syndrome: we can conjecture that a relationship exists, but we cannot identify the mechanisms through which the possible impact has taken place.

Examples of macro models that measure social impacts are:

- computable general equilibrium models (CGE)
- partial equilibrium models
- sectoral models
- macro-econometric models.

Computable general equilibrium (CGE) models

CGE models calculate a vector of prices such that all the markets of the economy are in (demand and supply) equilibrium, implying that resources are allocated efficiently. CGE models try to capture all economic and technological interrelationships, possibly reflecting policy influences on prices, multiple markets

1 See European Commission (2009) Impact Assessment Guidelines for more details.

and interacting behaviour of economic agents (consumers/ workers/ businesses). They are based on economic theory and theoretical coherence (that is, the Walrasian representations of the economy). Therefore, parameters and coefficients are calibrated with mathematical methods and not estimated, as in econometric modelling. They can be static – comparing the situation at one or more dates – or dynamic, showing developments from one period to another. CGE models require a social accounting matrix that is built by combining input–output tables (to model interrelations between productive sectors) with national account data.

Strengths:

- They are good for analysing general economic policies like public finance, taxation and social policy, and their impact on longer-term structural change.
- They have internal consistency; ie they allow for consistent comparative analysis of policy scenarios by ensuring that in all scenarios the economic system remains in general equilibrium (however, extensions to model market imperfections are possible).
- They integrate micro-economic mechanisms and institutional features into a consistent macro-economic framework. All behavioural equations (demand and supply) are derived from microeconomic principles.
- They allow for the evaluation of distributional effects across countries, economic sectors and agents.
- They consider feedback mechanisms between all markets.
- Data requirements are limited; since CGE models are calibrated to a base year data set, data requirements are limited even if the degree of disaggregation is high.

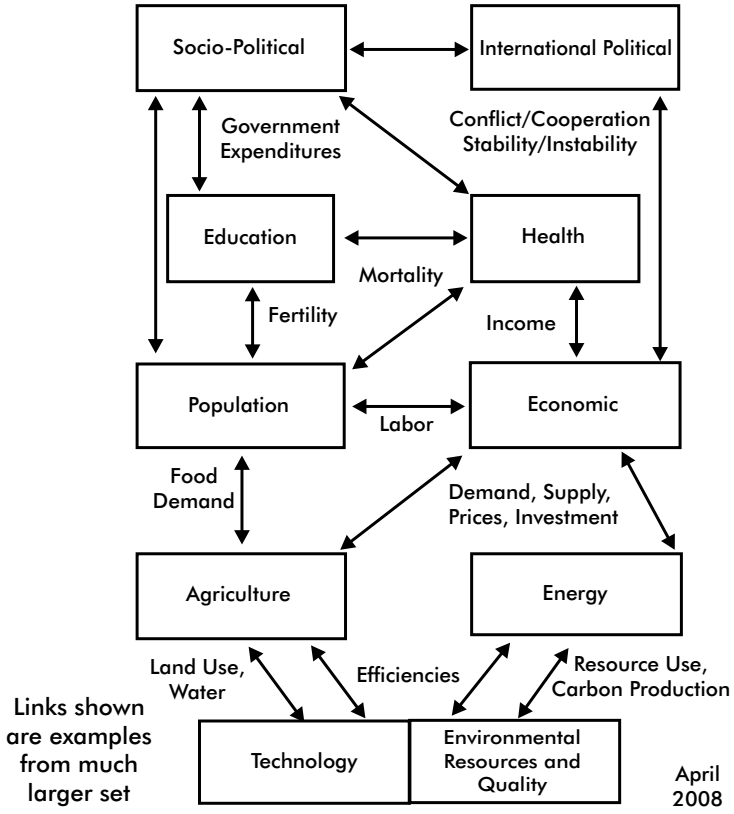
Weaknesses:

- The two main theoretical weaknesses in econometric analysis based on CGE modelling relate to the validity of two key assumptions: the neoclassical concepts of optimisation and rationality of individuals and the general equilibrium assumption based on market clearing. This is a somewhat tautological construction (all results are implicitly linked to the assumptions and calibration made). The result is that CGE models are complex, and results are often highly sensitive to model structure and hypothesis.
- CGE models typically lack a detailed bottom-up representation of the production and supply side. Since top-down models rely on the assumption that all best available technologies have already been installed, the calculated cost of, for instance, a specific emission reduction measure is typically higher than in bottom-up studies.

A CGE model can take a significant amount of time and expertise to build and develop. There are many globally integrated CGE models that have been constructed by various national and international organisations such as the EC, IMF, the Bank of England and other research institutes.[1] An example of a freely available model (International Futures, n.d.) is the International Futures model, which covers ten building blocks, as illustrated in Figure 18.1.

1 Examples of global CGE (computable general equilibrium) models: NEMESIS, ERASME, MULTIMOD, QUEST, NiGEM, Oxford World Macroeconomic Model and the BAK Oxford New IIS(NIIS) Model; GEM E-3 Model, International Futures System (IFS). Examples of EU-funded CGE models: EDGE; GEM-CCGT; GEM-E3; OECDTAX; PACE; WORLDSCAN.

Figure 18.1: Building blocks of the International



Source: University of Denver website[1]

1 http://www.ifs.du.edu/introduction/elements.aspx . Accessed June 2009

I Futures CGE model

Sectoral/partial equilibrium models

When the effects of the policy are quite circumscribed to a specific sector (eg transport) or sub-defined system, and the general impact on the economy (feedback and spillover effects) is negligible, a partial equilibrium approach may be a better way for the goal of evaluation. These models are constructed on the equilibrium of one specific sector of the economy.[1]

Strengths:

- They focus only on one economic sector and thus enable a relatively high degree of disaggregation and a detailed representation of the specific economic and institutional factors.
- Sectoral models are often very detailed since they are sometimes complemented by more specific (eg engineering-economic) bottom-up models. The latter are advantageous since they, for example, are able to handle nonlinearities.

Weaknesses:

- An inability to capture the effects on other markets and the feedback into the specific market under consideration.

Macroeconometric models

Macroeconometric models are designed to evaluate macro-sectoral impacts of economic policies, although they have been extended to incorporate environmental dimensions, human and social capital. [2]

Strengths:

- The validation of the equations of the model with statistical methods.
- The model's ability to provide short- to medium-term forecasting and to evaluate the impact of policies.
- These models also ensure a coherent framework for analysing inter-linkages between variables.

Weaknesses:

- Difficulty in capturing longer-term phenomena, since the equations on which they are based are linked to a given time framework.
- The degree of sectoral disaggregation is usually smaller than in calibrated CGE models due to extensive data requirements.
- Behavioural assumptions do not always rely on microeconomic theory.

18.3.2 Micro models

Micro models investigate and test assumptions about economic agents, their decisions, and interactions (individuals, households, firms/businesses) and how these affect supply of and demand for goods and services. It can answer questions such as: How frequently should screening for breast cancer be offered? What are people willing to pay for a better train service? Does a new road offer sufficient savings of time and reduction of accidents to justify its cost?

- **Data requirements:** disaggregated data or microdata, such as survey data from individuals, households or firms.
- **Good for:** evaluating the efficiency-specific policies that are designed to affect individual, household or firm behaviour (eg minimum wage or travel choices), or where the policy impact is limited to a particular group, sector or region (eg

1 Examples of EU funded sectoral models. Energy: PRIMES, POLES, SAFIRE. Transport: ASTRA, EXPEDITE, SCENES, TREMOVE, TRANSTOOLS, Agriculture: CAPRI. Emissions Trading: SIMAC.

2 Examples of EU funded macro-econometric models: E3ME; NEMESIS; QUEST II; WARM.

a new R&D policy). How much people are willing to pay for goods or services (see Discrete Choice Modelling chapter), optimising prices and minimising costs, measuring direct impacts on people and businesses, which is useful for cost-benefit analysis.

- **Bad for:** big picture, system thinking (although it is now possible to aggregate up).
- **Strengths:** can obtain very accurate cost estimates if trying to assess impact of intervention on people's behaviour, can obtain a very rich picture of people's behaviour under different circumstances.
- **Weaknesses:** difficult to extrapolate and generalise over time and contexts because of data limitations (getting longitudinal data to consider dynamic effects is difficult).

Example of micro models include:

- microsimulation models
- Markov chain modelling
- choice modelling.

Microsimulation models

Using microdata, microsimulation models evaluate policy interventions at the level at which they are intended to operate by computing the impacts on small decision units such as individuals (eg doctors or patients in the case of health care issues), households (eg looking at welfare support programmes) or firms (eg corporate tax effects) rather than on aggregates, such as the national economy or demographic subgroups of the population. By using a representative sample, micro-level changes can be aggregated in order to reproduce macro-level effects.

Strengths:

This modelling approach has three advantages that are not generally found in other policy analysis methods. First, it permits direct and fine-grained analysis of the complicated programmatic and behavioural interactions that abound in social programmes. Second, it permits detailed and flexible analyses of the distributional impacts of policies. Third, microsimulation models can simulate the effects of proposed changes on sub-groups of the population in addition to aggregate estimates of policy costs (Citro et al., 1994)

Weaknesses:

Generally, the main limitations of microsimulation models are the imperfect simulation of human behaviour and, in transport, the difficulty in modelling a network close to reality. Citro et al. (1994) cite six weaknesses of microsimulation modelling:

- Microsimulation modelling comes at a price: it requires large amounts of data, must model complex features of the policy intervention, and is therefore resource intensive.
- Microsimulation models may not adequately capture the uncertainty of the estimates produced.
- Often there are serious questions about the adequacy of the data sources used to construct microsimulation model databases.
- There are serious questions about the underlying base of research knowledge that supports the modelling of individual behaviour and other model capabilities.
- The adequacy of the computer hardware and software technologies used to implement current microsimulation models is questionable.
- The current structure of the microsimulation modelling community

is costly (cf the interrelationships among the policy analysis agencies that use microsimulation models, their modelling contractors, and academic researchers).

Markov models

Markov models, based on a decision tree that allows for recursive events, are used mostly in health disease management to calculate a wide variety of outcomes, including average life expectancy, expected utility, long-term costs of care, survival rates, or number of recurrences.

Strength:
Good when events are time sensitive (eg timing of clinical interventions); they require probabilities that are continuous over time, and when key events potentially occur at least twice.

Weakness:
Markov simulations include numerous assumptions and inferences and therefore a well-designed study needs to include sensitivity analysis, which varies key assumptions to test the robustness of the results.

Discrete choice models

Discrete choice models (DCM) are often employed to estimate a consumer's willingness to pay for goods and services and to assess the economic value of goods and services that are not freely traded. In areas such as transport, DCM is an important input into cost-benefit analysis. See Chapter 6 for detailed discussion of this technique.

18.3.3 Environmental impact assessment models (EIA)

These models are intended to measure and evaluate the environmental impact of policy measures on, for example, air, water, soil and habitat. The choice and use of quantitative models for impact prediction should be suited to the particular relationship being studied (eg transport and fate of oil spills, sediment loadings and fish growth, and pesticide pollution of groundwater aquifers) and the consistency, reliability and adaptability of models. Examples of the use of quantitative models include (UNU, 2007):

- air dispersion models to predict emissions and pollution concentrations at various locations resulting from the operation of a coal-fired power plant
- hydrological models to predict changes in the flow regime of rivers resulting from the construction of a reservoir
- ecological models to predict changes in aquatic biota (eg benthos, fish) resulting from discharge of toxic substances.

We discussed earlier that all models are simplifications of the real world. In EIA models particularly, the assumptions made can have significant implications for the accuracy and usefulness of the output data. EIA project managers should ask all specialists carrying out mathematical analyses to clearly state the assumptions inherent in the use of their models, together with any qualifications to be placed on the results.

Application:[1]
EcoSense (IER, 2004) is an integrated computer system developed for the assessment of environmental impacts and the resulting external costs from electricity generation systems and other industrial activities. Based on the impact pathway approach developed as part of a project funded by the European Commission, EcoSense provides relevant data and models required for an integrated impact

1 Examples of EU funded environmental impact assessment models: ECOSENSE; FUND; IMAGE; RAINS; SMART.

assessment related to airborne pollutants. The main modules are:

- a database system comprising several sub-modules
- air transport models completely integrated into the system
- impact assessment modules
- tools for the evaluation and presentation of results.

An established approach in these models is **impact pathway analysis**. This is a bottom-up approach for estimating external costs starting from a particular process and its emissions, moving through their interactions with the environment to a physical measure of impact (the main component being health), and where possible a monetary valuation.

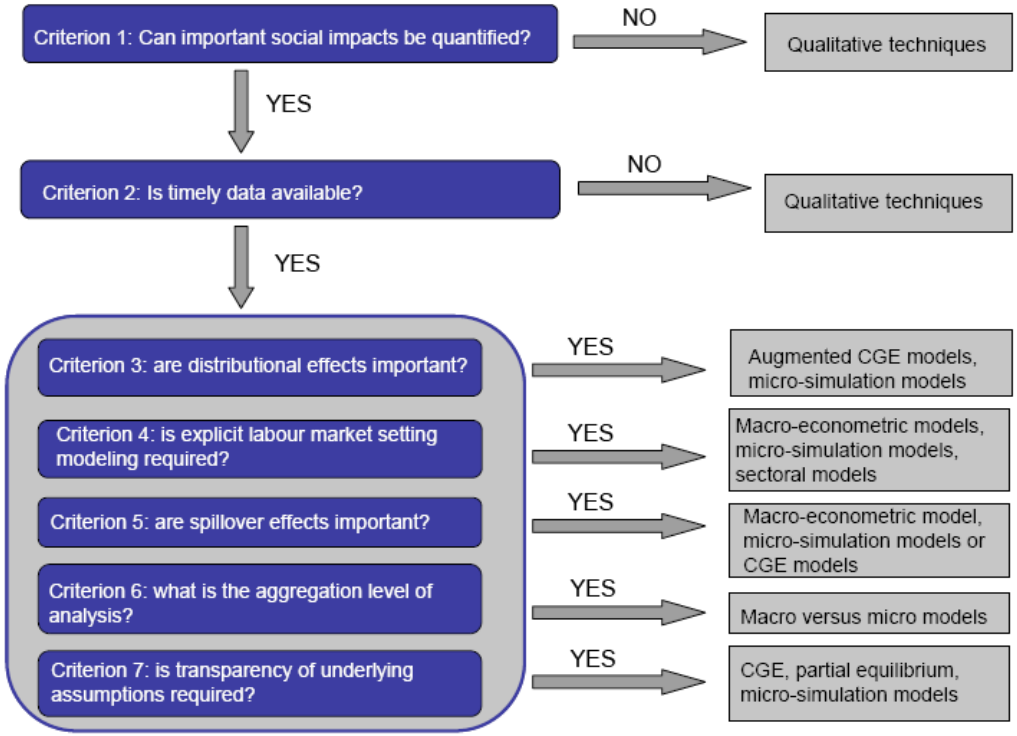
18.3.4 Choosing which model to use

The choice of statistical model depends on the type of question that is being investigated as well as practical factors such as: existing knowledge and expert opinion; the availability and format of relevant data; the intended use of the quantitative estimates; the timescale and resources available to conduct the assessment; and the availability and utility of available tools (eg software, programming skills, analytical resources) (Mindell et al., 2001).

Every case is unique and requires a different assessment method and model. When determining an appropriate assessment method for a particular policy initiative, several selection criteria should be run through. Ideas Consult and ECORYS have suggested the following selection criteria for deciding which model to use.

The European Commission has clear guidelines and selection criteria regarding the use of macro and micro models in impact assessments, and has invested heavily in building and developing purpose-built models that can be used for policy-related purposes (European Commission, 2009). Box 18.2 below shows the Commission's toolbox for quantitative analysis, reproduced here because of its extensive pertinence.

Figure 18.2: Selection criteria for choice of model



Source: IDEA Consult/ECORYS NL

Box 18.2: The IA TOOLS web site

IA TOOLS is an online platform that aims to provide European Commission policy actors and impact assessment practitioners throughout Europe with a repository of guidance, information and best practices for the impact assessment of new policies and legislative measures. IA TOOLS provides experts and non-experts with guidance on the main steps to be followed to perform an impact assessment. It contains an inventory of social, economic and environmental impact indicators. It also offers an overview of the qualitative and quantitative tools available for the analysis of policies impact as well as access to up-to-date databases.

The four main different IA TOOLS modules

- The **Impact Inventory** should help standardise the "Impact Identification, Analysis and Estimation step" of the Impact Assessment process and increase its comprehensiveness in respect to the consideration of, for example, indirect policy impacts. The links to potential data sources should also facilitate, in some cases, quantification. The Impact Inventory is structured along the impact areas breakdown (economic, environmental and social) adopted by the Commission Impact Assessment Guidelines. The Guidelines require in fact thinking over a number of key questions on the possible impacts of the different policy options. In IA TOOLS, each of those questions is complemented by a brief description, links to background information on the Commission web pages, and data sources (quantitative indicators related to each impact area) from Eurostat, from other European agencies (eg EEA), and from international organisations (eg OECD). Furthermore, it provides direct links into relevant data resources for the individual impact areas.

- The **Model Inventory** should make it easier for desk officers to determine, in the "Impact Identification, Analysis and Estimation step", whether the impacts of a certain policy proposal can be assessed and quantified using existing models. The provision of a central list of models, easily accessible, standardised and synthetic, is meant to guide and facilitate the adoption, when feasible and useful, of more sophisticated tools for Impact Assessment. Economic or technical modelling is not necessarily relevant or feasible for all aspects of impact assessment. IA TOOLS guides the user to those models that could be useful for the planned IA and provides background information out of a comprehensive model inventory. The Model Inventory contains a list of models that are in principle able to quantify impacts, either in physical or in monetary terms. Models are described in a non-technical way and contacts and references are provided.

- The **Good Practice Inventory** should provide desk officers with a guide to sound procedures and tools for the identification and quantification of policy impacts, comparison of policy options, design of stakeholder consultation processes and setting up of procedures for policy monitoring and evaluation. The Good Practices Inventory includes examples of impact assessments for different years (starting in 2003) and for all stages of impact assessment (from description of the problem to stakeholder consultation) in the European Union. The Good Practices Inventory is kept up to date and in line with the Impact Assessment guidelines of the Commission. However, as up-dates are carried out over 1-2 year cycles, minor discrepancies may occur temporarily between the outline of good practices in IA TOOLS and on the Impact Assessment information pages of the Secretariat General.

- The **IA TOOLS handbook** provides a resource centre with information and data bases which are useful for each stage of IA. The handbook describes, categorises and provides access to information related to IA and stemming from different sources (Commission documents, EU research projects, publications by Member States and international organisations). It is a resource that can be used to answer questions that arise when a specific IA is carried out.

For further information and feedback, please visit: http://iatools.jrc.ec.europa.eu

Source: European Commission Impact Assessment Guidelines

Table 18.1, also produced by the European Commission, gives a summary outline of the outputs that can be expected from the different types of model.

Table 18.1 What quantitative models can do

	CGE models	Sectoral models	Macro-econo-metric models	Environ-mental impact assess-ment models	Micro-simu-lation models
Range of coverage of measure					
Single-market analysis without economy-wide impacts		X			
Single-market analysis with economy-wide impacts	X		X		
Multi-market analysis with effects in secondary markets	X		X		
Ecosystem				X	
Purpose of model analysis					
Simulation (long-term)	X	X		X	X
Forecasting (short-/medium term)			X		
Effects to be analysed					
Economic effects (within given model framework)	X	X	X		
Ecological effects of economic activities	X	X	X	X	
Ecological effects				X	
Distributional effects					
between countries	X	X	X	(X)	
between sectors	X		X		
between households	X		X		X
Degree of disaggregation					
Between sectors or households					
potentially high	X				X
potentially low			X		
Within a sector					
potentially high		X			
potentially low	X		X		
Effects on:					
GDP	X		X		
Ecological damages				X	
Unemployment	X		X		
Public budget	X		X		
International trade	X		X		
Emissions	X	X	X	X	
Immission/deposition				X	
Household income	X		X		X

Source: European Commission (2009) Impact Assessment Guidelines

18.4 When to use quantitative techniques

Despite the "number-crunching" data-driven element of quantitative analysis, it is an art as well as a science. A solid grounding in theory and sound reasoning, as well as knowledge of econometric and statistical techniques and an understanding of the policy system, is needed for quantitative analysis to be useful in the evaluation context. Quantitative analysis is best employed in the following situations:

- when it is necessary to look deeper for policy evidence and indicators are required for normative action[1]
- when the impact of an intervention will be felt at the macroeconomic level rather than at a local level
- when justifying costs and making a case for large-scale government funding
- when empirical findings would be able to withstand public/external scrutiny, ie when sufficient data is available, methodology is robust, and assumptions are justified
- when there is sufficient data or when primary data collection is feasible.

18.5 When not to use quantitative techniques

In practise, applying quantitative analysis can be difficult and existing techniques may be restricted in their ability to deal with the various challenges. It is advisable to carefully consider how useful a model is when facing the following issues.

18.5.1 When there are theoretical issues

Standard economic ideas can be difficult to reconcile with how policy systems actually function. One needs to determine who the agents are, their preferences, incentives, etc. Sometimes the phenomenon of interest is below the resolution of an aggregate model and the analysis may miss key unmeasurable elements. A model structure will never be able to reflect every potential effect of alternative interventions, or exactly capture every feasible prognostic implication of those effects for every individual, firm or household. There are a large number of parameters to estimate from available evidence, imposing very high search and computation costs. Complex models also deter users. In this sense, all models are imperfect; however, the researcher may decide that what is sufficient is a model that captures the major characteristics of the intervention and balances the trade-off between the need for complexity and the need for tractability.

18.5.2 When there are methodological issues

Sometimes the policy question is new and poses methodological challenges that require significant investment of time and money in research design. This can offer new answers, and some Supreme Audit Institutions value new innovative approaches that can inform policy. However the usual methodological challenges that are often faced need to be considered thoroughly at the outset. These are two main considerations. There is more than one technique that can answer the same hypothesis and each may give conflicting answers. In addition, correlation may not be distinguishable from causation and also co-causation and endogeneity due to confounding interrelated factors can make impacts indistinguishable if not addressed directly.

1 The distinction between the positive and normative school of economic analysis. The former addresses the economic consequences of what happens if a policy is introduced, free of value judgement, while the latter is concerned with what ought to be, usually in the context of raising economic welfare. The positive analysis may well suggest – as for the VFM auditor – that things are less than optimal. This is likely, in turn, to indicate ways in which policy might be improved, and the distinctions again become blurred.

18.5.3 When there is insufficient data

Data models require considerable data input. Availability of comprehensive, high quality data is often low and the researcher has to consider whether to carry out primary data collection for the particular purposes of the evaluation if data does not exist; this can be costly. Data is often subject to reporting and coding inaccuracy (measurement error); missing data is a common problem and access to data can be difficult. This means that even if data exist, there might be small sample bias and lack of longitudinal data (same data collected across different time periods), difficulty in accessing information on certain sub-groups, or problems with incomparable date from heterogeneous data sources (different definitions, units of measurement, etc), particularly internationally comparable data across countries.

Box 18.3: Dealing with incomplete data

Missing data afflicts almost all surveys, and quite a number of experiments. Missing data can be a problem because it means the effective sample size is reduced, the representativeness of the data is compromised, and therefore there may be bias. Thus, missing data can influence both the analysis and interpretation of data. An understanding of reasons for missing data can help reduce the problem, as can the following:

- **Avoid missing data at the outset.** Missing data can be minimised at the outset by developing a well-designed data collecton instrument (eg survey, interview) with clear instructions and unambiguous and answerable items. Another strategy is, at the time of data collection, checking that all applicable data are collected before ending the interview, or phone call. Data returned by mail questionnaire can be checked for missing data and followed up accordingly, although this can be a time-consuming and costly process.
- **Understand the seriousness of the problem**. Identify the pattern, distribution, scale and reasons for missing data. Several statistical methods have been developed to deal with this problem.
- **Use an appropriate technique to deal with missing values.** The principal methods for dealing with missing data are:
  1. analysing only the available data (ie ignoring the missing data)
  2. imputing the missing data with replacement values, and treating these as if they were observed (eg last observation carried forward, imputing an assumed outcome such as assuming all were poor outcomes, imputing the mean, imputing based on predicted values from a regression analysis)
  3. imputing the missing data and accounting for the fact that these were imputed with uncertainty (eg multiple imputation, simple imputation methods (as point 2) with adjustment to the standard error)
  4. using statistical models to allow for missing data, making assumptions about their relationships with the available data.

  Option 1 may be appropriate when data can be assumed to be missing at random. Options 2 to 4 are attempts to address data not missing at random. Option 2 is practical in most circumstances and very commonly used in systematic reviews. However, it fails to acknowledge uncertainty in the imputed values and results, typically, in confidence intervals that are too narrow. Options 3 and 4 would require involvement of a knowledgeable statistician. (Higgins and Green, 2008, Chapter 16).

These difficulties suggest that a single comprehensive quantitative model for impact measurement will be very difficult to develop. Instead measurement and quantitative estimates of impact will necessarily refer to partial aspects of the potentially broad array of impacts, and will have to be part of a broader impact assessment approach that triangulates different research methodologies to produce robust findings.

Box 18.4: Dealing with endogeneity

"Endogeneity arises if there are other confounding factors that affect the intervention and outcome simultaneously making it difficult to disentangle the pure effect of the intervention. The key to disentangling project effects from any intervening effects is determining what would have occurred in the absence of the intervention (at the same point in time). When one establishes a functional relationship between treatment (inputs) and outcomes in a regression equation, endogeneity manifests itself when there is a non-zero correlation between the interventions, and the error term in the outcome regression. The problem is to identify and deal with the main source of endogeneity relevant to each intervention.

If one could observe the same individual at the same point in time, with and without the programme, this would effectively account for any observed or unobserved intervening factors or contemporaneous events and the problem of endogeneity does not arise. Since this is not doable in practice, something similar is done by identifying non-participating comparator (control) groups — identical in every way to the group that receives the intervention, except that comparator groups do not receive the intervention. There are two means of achieving this: experimental or quasi-experimental methods; and non-experimental methods.

Although both experimental and non-experimental methods are grounded in quantitative approach to evaluation, incorporating qualitative methods enriches the quality of the evaluation results. In particular, qualitative methods not only provide qualitative measures of impact, but also aid in the deeper interpretation of results obtained from a quantitative approach by shedding light on the processes and causal relationships."

Source: Ezmenari et al. (1999) How to conduct quantitative modelling

A basic quantitative modelling approach is as follows:

1. **Careful formulation of the question(s) of interest and identification of potential impacts:**
   - identify the hypotheses to be tested, the key parameters of interest and potential impacts by drawing up causal pathways and a conceptual model, by consulting with stakeholders and by reviewing relevant literature
   - identify the population groups, geographical scope and timescale over which to assess the impacts (eg short term or long term)
   - select impact measures.

2. **Construction of a formal economic/ statistical model:**
   - use the selection criteria outlined above to decide which model is most appropriate and compare this to what is suggested in the literature
   - be clear about the choice of model and be prepared to defend the use of this model in the analysis given its strengths and weaknesses
   - be explicit about the assumptions made
   - the model should be kept as simple as possible in order to aid understanding by decision makers; how simple will depend upon the sensitivity of the policy implications to added complexity (Buxton et al., 1997).

3. **Identify the data inputs and metrics required and carry out basic descriptive data analysis:**
   - Carry out an assessment of required and available data, which may include:
     - *cross-sectional*: sample of individuals, households, firms, cities, states, etc, taken at a given point in time
     - *time series*: data with observations on a variable or several variables over time
     - *pooled cross-section*: data consisting of cross-sectional samples, taken at several points in time
     - *panel or longitudinal*: data consisting of a time series for each cross-sectional member in the data set.
   - Are secondary data sources available? Is primary data needed? Can primary data be collected? Or should customised data be collected, eg roadside interview data? Does it cover the countries, length of time required, population targeted?
   - Select, or construct proxies/indicators that represent the impacts as closely as possible.
   - Defining and constructing policy proxies is an art rather than a science. There are no clear-cut guidelines to get a good policy proxy but be clear on the extent to which the data represents the world of interest.
   - Get a feel of the data. Display basic statistics in simple tables and charts as an initial step preceding the modelling.

4. **Empirical implementation and econometric estimation of the model:**
   - Is the appropriate software and expertise to build and run the model available?[1]

1 The most common general econometric software used are Stata, Eviews, PCGive, SAS. More bespoke packages are developed when more sophisticated techniques are required, such as Limdep for panel estimation techniques,

- There are many thorny issues that may be faced at this stage that involve testing the assumptions of the model to make sure that it is valid (eg tests of residuals in OLS regressions).

5. **Estimating the counterfactual situation:**
   - The core challenge of causal analysis is the issue of identification – the need to answer a counterfactual question, "What if the policy was never implemented?"[1]
   - Ideally, a "base case" model should be estimated which assumes the status quo situation, ie the world with no policy intervention compared to what actually happened or is expected to happen when the intervention was/is implemented.

6. **Carrying out model validation and sensitivity analysis:**
   - Try to explore uncertainty rather than compensate for it. Care should be taken to avoid framing the problem in an inappropriate way (eg by excluding a relevant alternative to, or attribute of, a particular intervention) (Buxton et al., 1997).
   - When using models, the robustness of the assumptions should be tested using sensitivity analyses that test the sensitivity of the outputs/impacts (eg GDP) to changes in the policy-related parameters.
   - Assumptions and uncertainties must be explicit.
   - Modelled data can sometimes be tested against empirical data; if possible, this is desirable.

7. **Assessing the significance and size of impact or effect of policy:**
   - This is done by carrying out statistical tests of coefficients in the model to accept or reject hypotheses by determining statistical significance of the impacts (ex post and ex ante).

8. **Optional step: Elaborating further on model outputs:**
   - Can the model be used to forecast?
   - Can the model say anything about impacts under different scenarios?

9. **Representation of outputs in a clear and coherent way:**
   - The presentation of results from the model should be as transparent as possible. Indeed, several journals and decisionmaking bodies may now request that the analyst makes the model and data available, in order to allow thorough scrutiny by reviewers (Buxton, 1997).
   - Displaying data in graphical charts and diagrams is often more effective than using tables and numbers. Displaying the vast amount of information that is produced in

Lisrel for structural equation modelling. For very advanced modelling that requires programming, software such as Gauss, RATs or even C++ may be used. Many organisations provide free access to their models, eg microsimulation models developed by Statistics Canada and others which may be a good starting point to build your own model.

1 There is always more than one possible answer to a counterfactual question so clearly the counterfactual situation is not observable, ie not identified. So in order to construct an observable counterpart you need to make adequate assumptions. Identifying assumptions are never right or wrong a priori, and cannot be proven right or wrong a posteriori. Identifying assumptions can only be more or less convincing, or more or less likely to be violated. Hence, a convincing answer to a counterfactual question, ie a convincing causal analysis, requires that for a well-defined unit of observation the value of an observable outcome variable (= success criterion) measured after the policy intervention is compared with the value of the outcome variable in an adequate comparison situation.

an understandable way for non-economists is a skill in itself. Other techniques can also be employed, such as GIS to map outcomes on geographic maps.

18.5.4 Other practical considerations

The development, adaptation and use of quantitative models can be time-consuming and resource-intensive. The decision to carry out quantitative analysis is often driven by consideration of the balance between capability (technical resources, experience and expertise), costs of having in-house analytical research competencies vs outsourcing, and benefits that accrue to the organisation if analysis is done in-house (eg of accumulating in-house expertise) (Brutscher et al., 2009).

On the other hand, organisations may also choose to employ external contractors, or collaborate with other parties (eg academia) to carry out quantitative analysis depending on either ad hoc or systematic needs of the organisation. The decision to contract out analytical services is mainly driven by resource or knowledge constraints but can also be driven by strategic growth ambitions through, for example, forming organisational consortiums (eg European Health Observatory) or collaborative partnerships, mostly with other similar organisations/agencies or universities. Please refer to Brutscher et al. (2009) for discussion of data strategy in organisations.

18.6 Quantitative methods in action

18.6.1 Computable general equilibrium (CGE) models

The European Commission asked RAND Europe this question: "What are the social and economic impacts of different regulatory scenarios for the future of Europe's ubiquitously networked society given the technology trends that are emerging?" The social and economic impacts were assessed through a CGE modelling tool called the International Futures System (IFS) in a scenario framework. The study concluded with a set of policy recommendations for the EC regarding the impact of regulation on the development of communication technologies and the economy based on IFS output, which tried to quantify the potential impacts in each future scenario.

18.6.2 Sectoral partial equilibrium models

The OECD uses a Policy Evaluation Model (PEM) (OECD Trade and Agriculture Directorate, 2008) to monitor and evaluate agricultural policies. This is a partial equilibrium model of the agricultural sector that was specifically developed to simulate the impact of policies on economic variables such as production, consumption, trade and welfare, by incorporating (inter alia) factor demand and supply equations within and across countries. PEM covers the major cereal and oilseeds crops, milk and beef production in six OECD countries/regions, of which the European Union is one. Each Producer Support Estimate (PSE) category (and some sub-categories) is modelled by price wedges in the output or input market in which they are considered to have first impact or effect. PEM results have been featured in studies of specific countries, in analysis of specific policy reforms such as the 2003 CAP reform, and for specific policy areas such as dairy policy. It is used by the OECD to carry out counterfactual policy scenarios illustrating the impacts of policies on production, trade, and welfare within and across countries; it is also used to investigate welfare-based questions such as transfer efficiency of programmes. Transfer efficiency measures the ratio of producer welfare gain to programme costs.

18.6.3 Macro-econometric models

The European Commission General Directorate of Research funded the development of the NEMESIS model (New Econometric Model of Evaluation by Sectoral Interdependency and Supply). It is a system of economic models for every European country (EU27), USA and Japan, devoted to studying issues that link economic development, competitiveness, employment and public accounts to economic policies, and notably all structural policies that involve long-term effects: R&D, environment and energy regulation, general fiscal reform, etc. NEMESIS is recursive dynamic, with annual steps, and includes more than 160,000 equations. These interdependencies are exchanges of goods and services on markets but also of external effects such as positive technological spillovers and negative environmental externalities.

The essential purpose of the model is to provide a framework for making forecasts, or "Business As Usual" (BAU) scenarios, up to 25 to 50 years, and to assess for the implementation of all extra policies not already involved in the BAU. NEMESIS has notably been used to study BAU scenarios for the European Union and reveal the implication for European growth, competitiveness and sustainable development of the Barcelona 3 percent GDP RT objective, of National RTD Action Plans of European countries, of European Kyoto and post-Kyoto policies, of increase in oil price, of European Action Plan for Renewable Energies, of European Nuclear Phasing in/out, etc. NEMESIS is currently used to assess European Action Plans for Environmental and Energy Technologies, for European financial perspective (CAP reform) and for Lisbon agenda, with in-depth development of the modelling of RTD, human capital and labour market, and European regions (European Commission MODELS project, 2009).

18.6.4 Microsimulation models

Given the emphasis on changes in distribution, microsimulation models that emphasise changes are often used to investigate the impacts on social equity of fiscal and demographic changes (and their interactions) (International Microsimulation Organisation, n.d.) in empirical tax policy analysis in several European and OECD countries.[1] Modelling of the distribution of traffic flows over a street network is another increasingly important use of the approach.

Over the last ten years, microsimulation models have been widely used. RAND Health researchers developed the COMPARE microsimulation model as a way of projecting how households and firms would respond to health care policy changes based on economic theory and existing evidence from smaller-scale changes. The COMPARE microsimulation model is currently designed to address four types of coverage-oriented policy options: individual mandates, employer mandates, expansions of public programmes and tax incentives. The model is flexible and can expand the number and variety of policy options addressed. Statistics Canada has also developed several microsimulation models of health and disease, lifetime behaviour of individuals and families and issues related to income distribution. These can be downloaded from the Statistics Canada website.

18.6.5 Markov models

Markov modelling was employed by the NAO in deciding what improvements needed to be made to better meet the needs of patients and carers in the UK (Hatziandreu et al., 2008). The NAO and RAND Europe worked together to produce a model which simulates

1 Examples of EU funded microsimulation models: EspaSim; ETA; EUROMOD: TAXBEN.

a patient's journey around a simplified health system over the course of the last year of life. The model estimated current costs to the NHS of end-of-life care for cancer and organ failure (heart and respiratory) patients and measured the cost implications of various scenarios of expanding home/community end-of-life services. They linked potential reductions in emergency admissions and length of stay to those services. Sensitivity analysis examined factors exerting influence in the overall costs of end of life care.

18.7 Summary

A range of quantitative techniques are available to study the impact of policy changes on macro and microeconomic environments. Care must be taken in selecting which method is to be used, and the choice must be based on an in-depth understanding not only of the policy factors being tested, but also the different input needs for the different models.

18.8 Further reading

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CHAPTER 19
Stakeholder engagement

Lila Rabinovich

19.1 Key points

- Stakeholder engagement can play a key part in the planning, implementation, monitoring, evaluation and audit activities of public institutions.
- Stakeholder engagement uses various methodologies to encourage collaboration and participation through the various phases of programmes and initiatives.
- Stakeholder engagement can also be used to promote transparency, improve accountability and resolve conflicts.

19.2 Defining stakeholder engagement

Stakeholder engagement is a relatively vague term used to refer to different processes taking place in different contexts. While there are no widely agreed definitions of *stakeholder engagement*, the process can be broadly understood as:

> *a structured process whereby institutions (companies, non-governmental organisations and public authorities) actively develop collaborative relations with other institutions, individuals and/or groups in the development, planning, implementation, and/or monitoring and evaluation stages of specific projects or activities, with the aim to ensure transparency, accountability, learning and/or consensus building.*

The *other institutions*, *individuals and/or groups* referred to in this definition are the *stakeholders*, this term denoting that they can affect or are affected by the primary organisation or its activities, or that they can help *define value propositions* for the organisation.

Box 19.1: Stakeholder engagement versus stakeholder consultation

Stakeholder engagement and stakeholder consultation are somewhat different processes, and it is useful to distinguish between them.

Stakeholder consultation typically involves a mostly one-way exchange between the primary organisation (or client) and those with/for whom it works (its stakeholders). Stakeholder consultations are used primarily to ensure that the client can identify and understand the needs and perspectives of its stakeholders, so that these can be incorporated effectively into a project's design and delivery.

In *stakeholder engagement*, on the other hand, stakeholders are engaged to *collaborate* with the primary organisation in the different stages of a project or programme.

Stakeholder consultations are becoming increasingly important for policy and public service delivery; for example, it is now mandatory for the European Commission to have stakeholder consultation before putting forward major pieces of policy and legislation, to ensure all relevant parties are adequately heard (EurActiv, 2006).

A number of conditions have been identified that enable effective stakeholder engagement. In particular, the *motivation* of all actors involved to engage in dialogue and *goal/s* from the engagement should be aligned, and some degree of *cultural affinity* usually needs to exist in order to enable effective communication and exchange. In addition, and from a practical perspective, all actors involved need to have the *organisational capacity* to engage (Lawrence, 2002).

19.3 When to use stakeholder engagement

Stakeholder engagement has been used in both the private and public spheres, as a tool for collaborative learning, conflict resolution, policy and strategy development. It can also be used as a mechanism to ensure equity, accountability and transparency in decisionmaking; in fact, many consider stakeholder engagement to be the foundation of corporate social responsibility in the private sector (Five Winds International).

Increasingly, stakeholder engagement is considered an important tool for monitoring, evaluating and auditing public institutions, and its use in this context is the focus of this chapter.

Unlike most of the other methods described in this Handbook, stakeholder engagement is not a methodology used primarily to generate evidence on a particular policy question. Rather, stakeholder engagement in the context of evaluations and performance audits can be an effective tool for mutual learning and consensus building. For example, stakeholder engagement can be used to help *define* the focus and direction of an audit, or provide input into the *analysis* and *interpretation* of findings from available evidence.

Box 19.2: Structuring stakeholder engagement in the public sector: the UK School Meals Review Panel

In 2005, the UK government set up the School Meals Review Panel (SMRP) in response to public and political calls for improvements to school meals in state schools across the country (Rubin et al., 2008). The SMRP was intended to review current standards in school meals and make recommendations for how they should change. The panel consisted of a range of key stakeholders including head teachers, governors, school and public sector caterers, trade unions, public health experts, dieticians and nutritionists, consumer and environmental groups, as well as representatives from the food industry. Among other activities, the panel produced a report with nutrition and other guidance for schools, which was widely welcomed and endorsed by Government, and which led to further funding being allocated by Government to relevant initiatives across the UK. According to members of this panel, this form of stakeholder engagement ensured that the panel broadly reflected the appropriate stakeholders, and that in spite of disagreements, those involved were able to compromise and arrive at enough of a shared set of goals to achieve progress on changing school meals.

19.4 When not to use stakeholder engagement

While stakeholder engagement can serve a wide range of purposes, as described above, it is important to note that there are two types of activity for which this approach is *not* suitable. First, stakeholder engagement is not typically used to generate and gather *evidence* on a particular issue. Methodologies for this purpose are described in other chapters of this Handbook. Second, it is not typically intended to *validate* evidence collected on a particular policy or evaluation question. Validation should be conducted by experts selected specifically for this purpose, on the basis of their expertise and independence.

19.5 How to conduct a stakeholder engagement exercise

The utility of stakeholder engagement depends not only upon the aim of the process, but also upon the stakeholders involved, and how their inputs are used. Stakeholder engagement is an inherently flexible approach, and can be adapted to suit the specific purposes, requirements and capacity of individual organisations. However, there are a small number of key considerations that should be taken into account in using stakeholder engagement. These are described briefly in this section.

19.5.1 Determine the aim of stakeholder engagement

As described above, there are many uses for stakeholder engagement in policy and evaluation processes. It is important that there is clarity from the outset, and among all stakeholders involved, as to the specific purposes of a stakeholder engagement process. This can be determined internally by the organisation conducting the stakeholder engagement process, but should always be communicated clearly and consistently to all external stakeholders. This can prevent misunderstandings further along the process regarding the type of input required and the way in which this will be used. More importantly, having a clear aim – and as far as possible concrete and measurable goals - can help ensure buy-in and commitment from the stakeholders throughout the length of the process.

19.5.2 Decide which stakeholders to involve

Stakeholders vary not only by organisation but also by type of activity within an organisation. For example, a national audit institution will have different stakeholders from a government department or a particular type of NGO. At the same time, the stakeholders in an audit institution's health-related activities will be different from those in transport or education-related activities.

In general, stakeholder groups can include the following, although this is by no means a comprehensive list:

- customer/service user groups
- employees and subcontractors
- service providers – statutory, private and not-for-profit
- interest or advocacy groups
- media
- academics/researchers
- funders – from statutory agencies, private companies and independent foundations
- government departments.

The decision as to which stakeholders should be involved in an engagement process should follow in part from the main purpose of the stakeholder consultation, and crucially, from a careful and considered assessment of the key stakeholders in the issue at hand.

It is often important to consider both up- and down-stream stakeholders, to ensure as much coverage and transparency as possible. For example, when assessing the performance of a service delivery organisation, it may be useful to involve both funders and commissioners of the services (up-stream stakeholders) as well as service user groups, employees and subcontractors (down-stream stakeholders).

19.5.3 Structure stakeholder input

As in the definition advanced earlier, stakeholder engagement should be a *structured* process, with formalised procedures for involvement that clearly set out expectations, norms and channels of communication between stakeholders and the organisation in charge.

There are many ways in which stakeholders can be engaged in a particular process. Workshops, focus groups and committees are but a few of the possible tools that can be employed for stakeholder engagement. Descriptions of some of these tools are provided elsewhere in this Handbook.

Box 19.3: Structuring stakeholder engagement at the European level: the European Alcohol and Health Forum

The European Alcohol and Health Forum, an initiative of the European Commission, was established in 2007 with the aim of providing a common platform for interested stakeholders at the European level to agree and implement actions to reduce alcohol-related harms, especially on children and young people. The Forum, led by the European Commission, is composed of researchers, non-governmental organisations, private companies in the alcohol industry, public health practitioners and advocates, and others. Each of the members of the Forum is requested to submit "commitments" which detail specific actions they will undertak

Source: European Commission (2009) Impact Assessment Guidelinese with the shared aim to reduce alcohol-related harms. The Forum then meets twice a year to evaluate progress on the commitments, discuss emerging issues and concerns, and continue the debate on effective ways to tackle the problem of harmful and hazardous alcohol consumption. In the case of this Forum, stakeholders engage in independent actions with a common aim, but then turn to the collective to evaluate and discuss progress with these actions.

Source: Author's. For more info, please refer to EU Alcohol and Health Forum

A particularity of stakeholder engagement is that it is not always a discrete phase of a project or activity, with a set period allocated to the process. Rather, stakeholder engagement can last for the duration of an activity, playing different roles at different stages. For example, stakeholder engagement can serve to help determine the strategic direction of a project, then to monitor or provide feedback on ongoing activities, and finally to help assess outcomes.

19.5.4 Use stakeholder input

The ways in which stakeholders' inputs are used will depend primarily on the stated aims of stakeholder engagement, which would have been set out at the beginning of the process. One of the main considerations at this stage is to ensure continued transparency about how stakeholders' inputs will be used; when the ways in which inputs are to be used are not clear, there is a danger of straining relationships with stakeholders, as a result of suspicions and misunderstandings about how different stakeholders' contributions are brought into play.

19.6 Summary

Stakeholder engagement is increasingly used by public (and private and third sector) bodies for a range of purposes, ranging from the development of comprehensive and acceptable activities and projects, to their effective implementation, to their evaluation. This chapter provides an overview of the ways in which stakeholder engagement can be used, highlighting the kinds of processes in which stakeholder engagement is a particularly useful tool.

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CHAPTER 20
Standard cost modelling *Carlo Drauth*

20.1 Key points

- Standard Cost Models (SCM) are used across Europe to measure and manage regulatory costs for business (SCM Network, 2008).
- Standard Cost Models attempt to break down the costs of complying with regulations into discrete components, each with their own monetary value.
- Standard Cost Models enable policymakers to identify where regulatory burdens significantly impact on business costs.

20.2 Defining standard cost modelling

Standard cost modelling is the most widely used methodology for measuring administrative burdens[1]. It consists of breaking down tasks associated with regulatory compliance into units that can be given a monetary value and hence help us to identify where costs can be reduced or removed altogether through improved regulation.

The Standard Cost Model (SCM) originated in the Netherlands, where the first attempts to measure administrative burdens were made in the early 1990s. Following further methodological refinements, the Dutch government finally adopted the SCM as its methodology for measuring administrative burdens in 2003. Since then, the SCM has been used in the Netherlands to measure the administrative burdens stemming from individual regulations as well as from national legislation. By analysing the latter, the Dutch government established in 2003 that the total administrative burdens for business amounted to €16.4 billion per year, or 3.6 percent of Dutch GDP. As a consequence, the Dutch government set itself an aggregate target to reduce the net administrative burdens by 25 percent by 2007 (from 2003 levels) (Bertelsmann Stiftung, 2006). The latest report of the Dutch Court of Auditors indicates that the 25 percent target has been met (Weijnen, 2007). Due to its success in the Netherlands, the SCM has been adopted – in one form or another – by many other countries, including the United Kingdom and Scandinavia, as well as by the EU (SCM Network, 2008).

20.3 Why do we need to reduce administrative burdens?

Business regulations fulfil an important function in society. They can modify corporate behaviour to match what is perceived as beneficial for society. For instance, business regulation can be used to set labour or environmental standards. However, if business is subject to excessive rules, regulation can become detrimental to public welfare. The challenge for policymakers lies in finding the right balance.

Some argue that this balance has tipped toward excessive regulation in recent years, forcing business to comply with an increasingly complex and burdensome system of rules[2]. Excessive regulation is not only costly

1 The SCM can also be used to measure the administrative burdens for citizens and the public sector. For the purpose of this handbook, however, this chapter only deals with the administrative burdens for businesses.

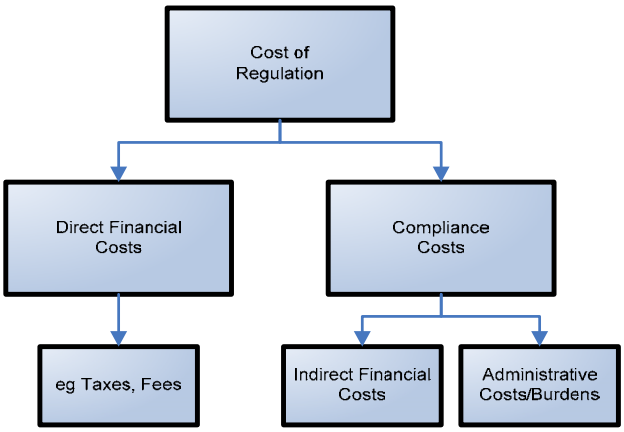
2 However, the assumption of excessive regulation has been disputed by a range of scholars (eg Radaellli, 2007).

for individual companies, who must allocate more and more financial and human resources to satisfy regulatory obligations, but is also costly for society at large, because excessive regulation for business is said to inhibit productivity and economic growth[1].

To avoid excessive regulation, policymakers first need to understand the nature of the costs that regulations impose on businesses (see Figure 20.1): these can be divided into two broad categories: (1) direct financial costs and (2) compliance costs. While the former refer to regulatory obligations that require businesses to transfer money to part of the government (eg paying a fee for a licence), the latter refer to costs of complying with regulation other than direct financial costs. These compliance costs can be divided into indirect financial costs and administrative burdens. Indirect financial costs are costs that businesses have in order to satisfy regulatory requirements (eg buying a filter to fulfil environmental requirements). Administrative burdens are costs that businesses incur in order to meet an information obligation imposed by regulation (eg producing an annual report on safety standards or applying for a licence to sell spirits).

1 Also the correlation between levels of regulation and economic performance is contested in part of the literature (see Helm, 2006).

Figure 20.1: Costs imposed by regulations



Source: RAND Europe

Most governments have made progress in reducing excessive regulation in relation to direct financial costs and indirect financial costs, but they have been less successful in addressing excess in administrative burdens. This is because direct and indirect financial costs are visible and measurable, and so more easily managed by governments. For instance, when a government reduces the fee for a licence from €100 to €50, the amount that regulatory costs will go down for business is clear. The situation is different for administrative burdens. For instance, when a government requires businesses to apply for a licence to sell spirits, it is difficult for the government to estimate the corresponding costs to business (SCM Network, 2005).

20.4 Benefits of the Standard Cost Model

The main strength of the SCM is that it makes administrative burdens visible by giving them a monetary value. This provides governments with enormous opportunities to reduce administrative burdens for business (provided the government has established an appropriate organisational infrastructure[1]). In particular, the high degree of measurement detail of the SCM, going down to the level of individual administrative activities, allows governments to reform only those parts of the regulation that are most burdensome to business. Important in this respect is that the SCM does not assess the content of regulation, but only the administrative burdens, which means that political objectives can be discussed separately in a cost-benefit analysis.

A further benefit of the SCM is that it can be used not only to measure the administrative burdens of regulations ex post, but also ex ante. This means that SCM measurements can be integrated into the cost sides of regulatory impact assessments.

Further to its application to individual regulations, the SCM can also be used to measure the administrative burdens arising from the entire national legislation (so-called baseline measurements), as done by the Dutch government. This allows overall reduction targets to be set. To commit individual governmental departments to the reduction target, specific reduction targets can be set for individual ministries, which they can be evaluated against on a yearly basis.

An EU-specific advantage is that, by comparing SCM measurements across member states, the most cost-efficient ways of implementing EU directives can be identified (Malyshev, 2006).

In the long run, it is hoped that applying the SCM will contribute to a cultural change within ministries toward a more cost-conscious approach to policymaking.

20.5 Potential pitfalls of the Standard Cost Model

Notwithstanding the success and increasing application of the SCM, some doubts have been raised in recent years. The overall criticism is that a given reduction in administrative burdens, say 25 percent, as in the Dutch case, does not necessarily reflect the gains to business and society at large. The reason for this is that some of the assumptions underlying the SCM are said to not hold in practice.

First, administrative burdens cannot be considered independently from policy objectives (Radaelli, 2007). In some instances, the SCM goal of cost-efficiency is said to conflict with equity and other policy objectives.

Second, the assumption that the benefits of regulations remain unaffected by a reduction in administrative burdens is disputed

1 That is, interdepartmental steering groups and a "watchdog" exercising oversight of SCM measurements.

(Wegrich, 2009). This might have serious macroeconomic consequences since too little regulation might inhibit competition and investment and thus the creation and efficient operation of markets (Helm, 2006).

Third, just because administrative burdens are reduced does not necessarily mean that a business will save money or become more productive (Keyworth, 2006). Consider the example of a small or medium-size firm that employs one bookkeeper to do all the paperwork. If a revised regulation reduces her workload by 5 percent, does it follow that she can use this 5 percent in a productive manner? If (a) the firm is efficiently organised and (b) adapting her working hours is not possible due to labour law, she probably cannot (Weijnen, 2007). This example shows that the SCM does not factor in opportunity costs. As a result, the alleged correlation between aggregate regulation and economic performance has been repeatedly questioned (Helm, 2006).

Fourth, the administrative burdens measured by the SCM may overstate the actual burdens imposed on business for two reasons (Keyworth, 2006). First, some administrative activities would be undertaken by businesses in the absence of regulation, because market or internal information needs require them (eg labelling requirements related to product safety). Second, compliance with regulations is taken for granted in the SCM measurement process.

Finally, the SCM measurement process is not always carried out properly. Inaccuracies in the SCM may result in incorrect estimates of the administrative burdens for business and thus in policies with unintended consequences. This is especially worrisome given the repeatedly reported difficulties of policymakers in applying the SCM.

20.6 Conducting a standard cost modelling exercise

The SCM measurement process consists of gradually breaking down a regulation into manageable components that can be measured in monetary terms. The process can be summarised in seven steps[1].

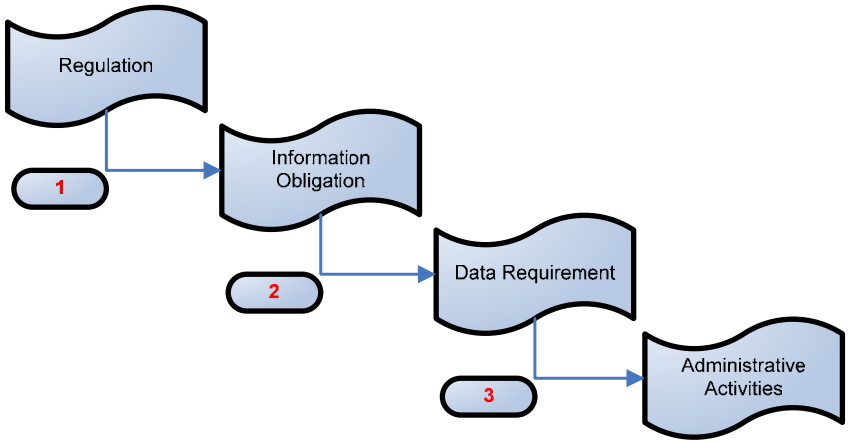
1. A given regulation is scrutinised for potential information obligations on business, for instance having to produce an annual report on safety standards, or applying for a licence to sell spirits. Information obligations do not necessarily have to be reported to some part of government or third parties, but sometimes need to be held on file for possible future requests.

2. Each information obligation identified in the first step is scrutinised for necessary data requirements. Data requirements are elements of information that are needed to comply with an information obligation.

3. The administrative activities necessary to satisfy the data requirement are identified. A list of standard administrative activities includes familiarisation with information obligation, information retrieval, information assessment, etc.

1 The seven steps described here give a simplified version of the SCM measurement process. For a more detailed explanation, see OECD (2007); SCM Network (2005); Nationaler Normenkontrollrat (2008).

Figure 20.2: Steps 1–3 – disaggregating regulations into administrative activities



Source: RAND Europe

4. Having disaggregated a regulation into administrative activities, the costs of these administrative activities are identified through selected interviews with affected businesses and expert assessments.

5. The standardised costs of a normally efficient business for each administrative activity are calculated and scaled up to the national or EU level. The formula is:

   Cost per administrative activity =
   H × P × N × F
   where:
   H = number of hours/minutes spent on necessary administrative activities
   P = hourly pay for internal (and external) workers that perform these administrative activities
   N = number of businesses affected
   F = yearly frequency of imposed information obligation.

6. A report is produced that highlights which regulations and, maybe more interestingly, which parts of the regulations are particularly costly to business. This information enables policymakers to simplify legislation and reduce costs to businesses.

Box 20.1: Standard Cost Modelling in action: "Breeding Cow Premiums"

An Example for SCM Measurement: Application for "Breeding Cow Premiums"

The following example applies the seven steps to measuring the administrative burdens for farmers resulting from Commission Regulation (EC) No. 1503/2003 regarding advance payments in the beef and veal sector.

Step 1 - Identification of Information Obligation:

Commission Regulation (EC) No 1503/2003 is scrutinised for potential information obligations for farmers. The scrutiny shows that farmers are required to follow a certain application procedure in order to receive breeding cow premiums.

Step 2 - Identification of Data Requirements:

Data requirements needed to complete the application procedure for breeding cow premiums are identified. Two data requirements are found: submission of application and submission of cow passes.

Step 3 - Identification of Administrative Activities:

The administrative activities needed to satisfy the data requirements (ie application and cow passes) are identified.

To submit the application, the following administrative activities have to be performed:

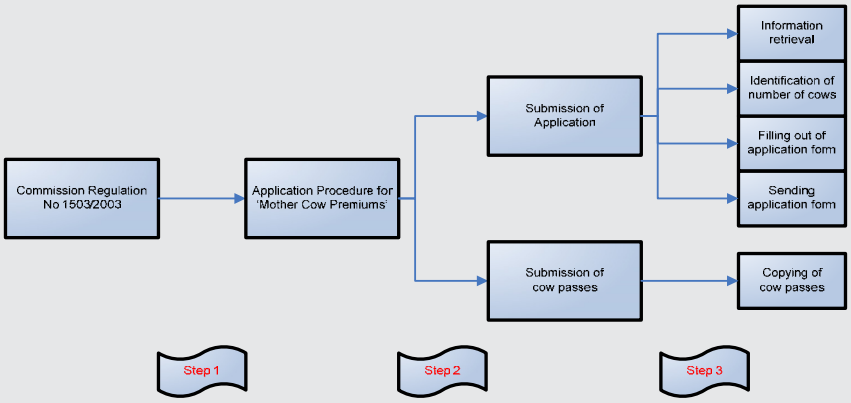
- information retrieval
- identification of number of cows for which "mother cow premium" is applied
- filling out application form
- sending application form.

To submit cow passes, the following administrative activities have to be performed:

- copying of cow passes.

Continues

Illustration of Steps 1 to 3



Source: RAND Europe

Step 4 - Identification of Costs for Administrative Activities:

The costs of these administrative activities are then identified through selected interviews with affected farmers and expert assessments.

Step 5 - Standardisation of Costs for a Normally Efficient Business:

The costs obtained are standardised/averaged to get a single estimate for a normally efficient business/farm to complete each administrative activity.

Step 6 - Calculation and Scaling Up of Costs:

The standardised costs of a normally efficient business/farm for each administrative activity are calculated and scaled up to the national level using the formula:

$$\textbf{Cost per administrative activity} = H \times P \times N \times F$$

Data requirement	Administrative activity	Time in hours (H)	Hourly pay in € (P)	Number of farmers affected (N)	Yearly frequency (F)	Administrative burdens in €
Submission of application	Information retrieval	30/60	15	10,000	1	75,000
	Identification of number of cows	60/60	15	10,000	1	150,000
	Filling out of application form	30/60	15	10,000	1	75,000
	Sending application form	15/60	15	10,000	1	37,500
Submission of cow passes	Copying of cow passes	15/60	15	10,000	1	37,500
						375,000

Source: RAND Europe

Step 7 – Report:

The final report highlights which parts of the regulation, if any, are particularly costly to farmers. This information enables policymakers to simplify Commission Regulation (EC) No 1503/2003.

Note: While Commission Regulation (EC) No 1503/2003 exists in reality, the SCM measurement presented here is purely fictitious. The example has been adapted from Bertelsmann Stiftung (2006).

20.7 Summary

Standard cost modelling aims to apply monetary values to administrative tasks in order to measure the burden they place on businesses or other actors who must perform these tasks. While it enables policymakers to identify where regulations significantly impact on business costs, the results must be taken in a broader context because some of the assumptions upon which SCMs are based can be questioned.

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