



Effectiveness and efficiency of committee work

A rapid systematic review for NICE by its
Research Support Unit



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Executive summary

Background

Making collective decisions faces new challenges in the 21st Century: a growing expectation for evidence-informed decisions for public policy; policy support for involving relevant stakeholders from different backgrounds; and economic pressures which limit time and resources. The first challenge requires group members to engage with highly technical information in order for decisions to be based on high quality research. The second challenge arises from policy support for involving a broad range of stakeholders, including professionals, patients and the wider public, all of whom may consider the issues from different perspectives and some of whom may be unfamiliar with the technical information under consideration. This raises problems with information asymmetry, competing interests, implicit and explicit hierarchies, language and other cultural differences. The third challenge, in an era of financial constraints, is not only for committees to achieve the desired effect of high quality decisions, but also to do so productively with minimum wasted effort or expense.

This review was commissioned by The National Institute for Health and Care Excellence (NICE) from its Research Support Unit (a multi-disciplinary academic unit based at the UCL Institute of Education (IOE)) to provide a rapid assessment of the evidence for the impact of the structure and management of committees on decision making and outputs. Like the rest of the public sector, NICE must ensure that it not only uses resources efficiently and effectively, but that it also regularly seeks to identify efficiency savings. Committee meetings - including their administration, accommodation and servicing costs - represent a significant part of NICE's annual budget, and this review may help to identify areas where they could be set up and managed in a more efficient manner.

A small consultation exercise with people having direct experience of committee work in different sectors was followed by a rapid review of the evidence. The results are described below.

Review questions

This review sought to address the following question:

What does the evidence tell us about the effectiveness and efficiency of committee work?

Sub-questions ask about:

1) Committee structure and environment:

- a) 'The optimal composition (e.g. topic generalists or specialists, past committee experience/ skills, demographics - gender, ethnicity, age) and size for decision-making committees, and the advantages and disadvantages of groups of different compositions and sizes (i.e. impact on the outputs and of decision making)?'
- b) The impact of environmental factors on committee work (e.g. layout, environment, acoustics, lighting, heating, air conditioning, spatial capacity)

2) Chairing:

- a) The most effective type of committee chair (competencies, skills e.g. topic specialists vs generalists)

3) Committee processes:

- a) The impact of meeting length, number and timing on committee work
- b) Effective and cost effective processes and structures for supporting committee decision making (for example, consensus techniques, decision support tools)
- c) How use of different media (e.g. videoconferencing, email) for committee interaction impact on decision making and costs
- d) Equity considerations associated with different committee structures and processes
- e) The impact of training on technical and engagement issues for committee chairs, committee members and secretariat.

Methods

We consulted a few individuals with direct experience of working with committees, either in the health sector or in business administration, about what issues relating to effective and efficient committees deserve attention. We drew on their responses when discussing the evidence available in the research literature.

An iterative search was designed to capture studies from diverse literatures quickly: broad yet simple searches that cut across academic disciplines (Google Scholar and the library catalogue at the London School of Economics and Social Sciences); searching a set of electronic sources each of which targeted particular contexts or approaches to research; and searching for systematic reviews. A subsequent strategy of inspecting reference lists and searching for citations of eligible studies was chosen as a rapid way of identifying additional and similar, relevant studies.

All reports were appraised for their relevance to the overall review question and, where possible, matched to a specific sub-question. Their methods and findings were appraised for the type of evidence they offered. A range of evidence drawn from different types of reviews and primary studies was identified and used to address different questions. In general, when addressing each sub-question for this review we drew on literature reviews for which we could discern how authors had identified and selected studies to meet clear or implied eligibility criteria. For evidence about models to understand or assess the performance of committees, we drew on theoretical syntheses of literatures. We used primary studies only when collating indicators of effective and efficient group performance or decision-making.

The synthesis was conducted in two stages. The first stage synthesised findings for each review sub-question that had been reported by earlier systematic reviews. These findings offered evidence of what works, and presented explanations of what works.

The second stage synthesised findings from systematic reviews that offered frameworks for clarifying the meanings of 'effective' and 'efficient' when applied to committees, or models or theories to enhance understanding of decision-making groups.

Results

We identified 106 relevant reports which addressed the following literatures: guideline development (49), business administration (34), group dynamics/ facilitation practice (19), organisation or social psychology (13), research committees (2), and ergonomics/ design (2). Some studies spanned two or more literatures.

Evidence about effective and efficient committees comes from studies of decision-making groups in both naturalistic and ‘laboratory’ settings. Studies with ‘laboratory’ settings were predominantly found in the psychology literature. Studies with naturalistic settings were mainly in guideline development for health, business administration and where business and health overlap, health care boards.

The scope and diversity of the literature, and the speed of the work, mean that we cannot claim to have identified all relevant studies. This limitation is counteracted by our reliance on systematic reviews and theoretical syntheses, which allowed the work to be completed quickly while drawing on extensive literatures.

Evidence of ‘what works’ was drawn from systematic reviews of empirical studies of guideline development and business administration committees. Their findings were confirmed and explained by theoretical syntheses drawing on different sets of studies, and discussed in the light of a broader literature addressing the social and technical processes within committees.

Summary of key findings:

Existing systematic reviews have generated the following evidence regarding committee behaviours and processes.

Composition and size of decision-making groups: There is little generalizable evidence for how the characteristics of participants and groups influence the judgements produced in formal consensus development methods. However, multi-specialty groups tend to be recommended over single specialty groups in order to take account of a wider range of opinion. Similarly, larger groups offer opportunities for more diverse membership which, when managed well, lead to better performance. They also offer more reliable judgements but may be more difficult to manage and encourage equal participation. Below about six participants, reliability will decline quite rapidly, with improvements in reliability subject to diminishing returns with more than 10 - 12 participants. Larger groups allow the membership to reflect a broader range of key characteristics and opinions of the population of experts from which the participants are drawn. This may also enhance credibility and widespread acceptance of the final guidelines. They also allow more varied membership which leads to better performance (more perspectives and considerations of alternatives), particularly for non-routine tasks, although conflict may arise between diverse participants. The difference in performance and acceptance of including experts in a committee versus them inputting via consultation has not been explored.

Members are more likely to advocate familiar options (which may come with a financial interest, although the evidence for this is drawn largely from recommendations made outside committees). These initial opinions may affect the group process. For instance, initial consensus may be followed by a shift to a more extreme decision. Alternatively, following an initial split view, members will either move towards one another’s views or cohesive subgroups may form to polarise views. Groups with similar compositions are likely to reach similar conclusions.

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Environmental factors: There is a lack of evidence about the impact of environmental factors (such as room layout, décor, acoustics, lighting, heating, air conditioning, spatial capacity) on group decision-making but reviews suggested that groups valued good working conditions.

Competencies of effective chairs: There is little rigorous evidence about what specific competencies make an effective chair. The role of corporate board leaders is seen to be crucial in establishing inclusive working procedures and an atmosphere of openness, dialogue and trust. Facilitators can help groups to generate more ideas through encouraging members to express diverse opinions and by delaying expressing their own opinion.

Timing of committee work: In ‘laboratory studies’, where prior knowledge was manipulated, groups often focused their discussions on information that all members know at the outset, although this was less so when they had to choose among a small number of decision alternatives and were pressed for time.

Effective processes and structures for supporting group decision making: In general, the formal consensus methods tested perform better than informal techniques but the reasons are not clear. Some aspects that are likely to be important include: ensuring that all members have a chance to voice their views; ensuring that all options are discussed; providing feedback and repeating the judgement; and ensuring that individual judgements are made confidentially. It is likely that a good facilitator who can ensure that the procedure is conducted properly will enhance consensus development but there is no rigorous evidence to support this. Providing guideline groups with the review literature results in decisions which are closer to the available research evidence. Effective group processes that need to be supported include: challenging assertions, managing constructive conflict, teamwork, common sharing of goals, active engagement and openness. Conflicts of interest should be ascertained and the appointment of group members be based on objective and explicit criteria.

Use of media for committee interaction and decision making: Although formal processes are better than informal processes, there is no evidence to suggest there are any major differences in the outcomes achieved between the effectiveness of the Delphi method (used with geographically dispersed groups) and Nominal Group Technique (for face to face meetings); rather, they may be more or less suitable for different purposes and circumstances. For example, the former may prevent undue influence by individuals, and the latter may provide better opportunities for discussion.

The use of computer aided communication (email and ‘chat’) for group decision-making was systematically reviewed twelve years ago. At that time, results suggested that ‘computer-mediated communication leads to decreases in group effectiveness, increases in time required to complete tasks and decreases in member satisfaction compared to face-to-face groups’. Review level evidence is not available for new forms of media such as web-conferencing and the use of online expert panels and web-based guideline development groups which may be viable alternative methods for group decision making.

Issues of equity: The commercial and public sectors encourage diversity in boards but there is little evidence that it improves performance. At consensus conferences, participation is uneven and related to status and expertise, so that people have participated: actively and continuously; intermittently; or little. In smaller groups, members with higher status/expertise/initial position often exert more influence over the group. If members’ status is equal or similar, majority opinion influences the outcome of

decisions that require judgement. Otherwise, higher status members sometimes have greater influence over judgements. For intellectual group tasks whoever finds the correct answer tends to have most influence regardless of their status. In non-inclusive cultures, the influence of women on corporate boards was limited unless they make alliances with the most influential members; women tended to have more influence when they were well prepared and employed challenging questions as their main contribution.

Impact of training: Public and voluntary sector boards place greater emphasis on initial selection and recruitment of board members than on training and development.

Development activities for members of decision-making groups are often *ad hoc* and informal despite recognition (but no evidence) of their importance for effective group functioning and individual skill building. There were examples of good practice around training and development which incorporates coaching, succession planning, support, development and performance appraisals.

Committee decision-making theory: Empirical evidence supports theoretical models to advance our understanding and assessment of how committees work effectively and efficiently, or otherwise.

Committee performance depends upon the individuals involved, their attributes and relationships, specifically, members who: are aware of their tasks, roles and responsibilities; understand the wider the context and culture; bring analytical and political competence, interest and willingness; offer time and commitment; actively participate; and behave appropriately over external relationships, confidentially and conflicts of interest.

An important resource is the knowledge brought by individual members, which is unevenly distributed, or presented to them in committee papers or presentations. Demographic diversity has been seen as valuable in bringing different perspectives and a wider variety of alternatives for consideration. Educational and functional diversity has given teams greater strategic clarity.

In addition to the knowledge and skills, is the time available for a committee to explore that knowledge to make choices or solve problems. Time for information processing during decision-making allows more sharing of knowledge; the more knowledge is shared during discussion, the more it is subject to evaluation by group members. When time is limited, less knowledge is shared and decisions are more the result of negotiating between prior preferences, rather than evaluation of shared knowledge. When tasks involve judgements (rather than problem solving) status within the group influences decisions.

With more time, greater facilitation skills to maximise sharing of knowledge, and greater mutual trust developed as committees mature and members get to know each other, more information about all options is revealed and available for evaluation. The result is more sharing of ideas and individual learning, better quality decisions, more commitment to decisions by group members and wider acceptability of decisions within the group's wider networks.

Implications for practice

The findings of this review have a number of implications for the organisation and management of committees.

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Committee composition and size: Having members representing the full range of stakeholders could bring the full range of relevant knowledge to discussions, although increasing the size of a committee above 12 members has diminishing returns.

Competencies of effective chairs: Given that members' views tend to favour their own specialist areas, and that good decisions arise from constructive conflict, effective chairs are more likely to be generalists with good facilitation skills to help members share their knowledge; manage hierarchy and conflict constructively; and develop an atmosphere of inclusiveness, openness and trust. Particular effort should be made to reveal knowledge initially held by individual, rather than all, members especially if their status is not high.

Timing of committee work: Time is required to allow knowledge brought to the meeting to be shared and evaluated before decisions are made.

Effective processes and structures for supporting group decision making: Formal consensus methods are recommended, with guideline groups given the relevant technical literature to inform their decisions.

Use of media for committee interaction and decision making: Distance working reduces the influence of individuals, but also opportunities for discussion. Computer-mediated communication (email and chat) may take longer and reduce member satisfaction. However, review level evidence was not available for recent advances in information and communications technology (ICT).

Diversity and equity issues: Demographic diversity is valued for bringing different perspectives and a wider variety of alternatives for consideration. Educational and functional diversity has given teams greater strategic clarity. More time and effort may be required to explore issues requiring judgements where committee members vary in status.

Implications for research

This review identified a number of gaps in the evidence on committee effectiveness and efficiency, as follows:

Communication media: Review level evidence is required for videoconferencing and teleconferencing to discover if these recent advances overcome the disadvantages of earlier computer-aided communication such as email and 'chat'.

Physical environment: Primary studies have not addressed the impact of environmental factors (e.g. layout, décor, acoustics, lighting, heating, air conditioning, spatial capacity) on committee performance.

Effective processes and structures for supporting group decision making: Development activities are seen as important for effective group functioning but are poorly evaluated.

Future monitoring or evaluation specifically of decision-making processes should consider the quality of group decisions in terms of: the degree of consensus within the group; the attitude of the group towards the processes and the decisions; and the implications of decisions in terms of organisational performance (governance, effective and efficient service, public confidence).

Training: More research is needed about how to train committee members.

1. Background

1.1 Policy background

The National Institute for Health and Care Excellence (NICE) supports healthcare professionals and others by developing guidance to make sure that the care they provide is of the best possible quality and offers the best value for money.¹ This guidance, and other related products, is developed by independent advisory groups. NICE's four guidance centres use advisory groups of different sizes and structures, and manage the process of evidence review and decision making in a range of different ways. This variation raises questions about how to work together and make collective decisions effectively and efficiently.

Decisions made during the development of guidance need to be evidence based, appropriate to the service or intervention for which they are intended, and acceptable to the managers and practitioners who are expected to implement them, as well as to service users. For this reason, there is an emphasis in the guideline development literature on group members being drawn from the networks of people expected to follow guidelines and on decisions being made by consensus rather than decisions made by hierarchy or majority rule. The aim of consensus development is to hear and consider contributions from all members of the group to reach a decision which, even if not each member's preferred solution, is considered acceptable and supported by them all.

The challenge of making decisions that are acceptable to a small group and to its wider networks is common to decision-making groups more widely. These are advisory bodies, groups and committees in the public, commercial and charitable sectors. Although decision-making groups vary in their terms of reference and their terminology, the generic terms 'committee' and 'board' share similar meanings: a committee being a body of people 'appointed or elected (by a society, corporation, public meetings etc) for some special business or function'; and a board being a body of people 'officially constituted for the transaction or superintendence of some particular business, indicated by the full title as... 'Board of Directors' ' (Oxford English Dictionary 2015). Given the similarities of these definitions, in this report we use the term 'committee' as the generic term, and the terms advisory groups, bodies, panels or boards to describe specific circumstances.

Committees in the health sector, where members are drawn from a range of stakeholders, such as clinicians, patients, managers and researchers include: evidence-based guideline development groups; research ethics committees; and research steering or advisory groups. Challenging issues for running all such groups include information asymmetry, competing interests, implicit and explicit hierarchies, language and other cultural differences. There is also a risk that groups may conform rather than critically evaluate options and so make poor decisions through 'group think' (Turner and Pratkanis 1998). Similar challenges are faced by committees elsewhere which have similar tasks and memberships. Such groups have responsibilities for corporate governance in the commercial and non-profit sectors, health and safety in the workplace, and accountability of public bodies.

Convening and managing groups for making collective decisions share committee conventions such as formal agendas, speaking through the chair, voting and minutes that

¹ www.nice.org.uk/aboutnice/

have evolved through democratic institutions over the past millennium.² Applying these conventions to decision-making in the policy context of health care in the 21st century introduces three new challenges. The first challenge is, given the strong policy support for evidence-informed decision making, the requirement for group members to engage with highly technical information in order for decisions to be based on high quality research. The second challenge arises from policy support for involving a broad range of stakeholders, including professionals, patients and the wider public, all of whom may consider the issues from different perspectives and some of whom may be unfamiliar with the technical information under consideration. Inclusive groups have members with different types of expertise: expertise that is certified by professional qualifications; expertise that is apparent in their ability to frame or solve problems; and expertise that is accrued from daily experiences at home, work and elsewhere (Blackmore 1999). Hierarchies, mutual expectations and discussions can be shaped by narrow and broad attitudes towards different types of expertise (Stewart 2007). The third challenge, in an era of financial constraints, is not only for committees to achieve the desired effect of high quality decisions, but also to do so productively with minimum wasted effort or expense; thus, committees need to be both effective and efficient. Recent technological advances now offer the option to replace or supplement face-to-face meetings with electronic communication, such as electronic voting within face-to-face meetings, or audio/video conferencing for discussions and decisions at a distance. For instance, a more efficient (and transparent) model has been proposed where group members make more contributions through a questionnaire and hold fewer meetings (Raine et al. 2005).

Like the rest of the public sector, NICE must ensure that it uses resources efficiently and effectively, and regularly seeks to identify efficiency savings. Committee meetings - including their administration, accommodation and servicing costs - represent a significant part of NICE's annual budget, and this review may help to identify areas where they could be set up and managed in a more efficient manner.

1.2 Research background

The most comprehensively synthesised evidence about guideline development is sixteen years old (Murphy et al. 1998). Part of this scope was updated eight years ago when Hutchings and Raine (2006) reviewed studies that involved formal consensus development methods and reported differences in judgments between groups or participants. A series of systematic reviews of systematic reviews was published the same year (see Oxman et al. 2006a).

Since then individual studies have been published about the workings of clinical guideline development groups, and about similar groups in the commercial and charitable sectors. For instance, a study of the factors influencing the effectiveness of research ethics committees by Schuppli and Fraser (2007) identified aspects of committee composition, dynamics, recruitment methods, motivation for joining, workload and member turnover. The authors stated that one of the assumptions behind the creation of research ethics committees is that decisions made by groups are superior to those made by individuals. Their results, however, pointed to some features of group decision-making - committee structure, social influences and recruitment processes - which can lead to biases or polarisation.

There is a body of literature from the corporate and charitable sectors that focuses on the effectiveness of boards. A survey of charity boards concluded that board inputs and other

² www.althingi.is/kynningarefni/index_en.html

characteristics are important in explaining board effectiveness, namely: 'board members have the time, skills and experience to do the job; clear board roles and responsibilities; the board and management share a common vision of how to achieve their goals; and the board and management periodically review how they work together' (Cornforth 2001). Further studies examine boards in relation to structure, size, gender and ethnic diversity. However, in many cases studies of these boards defined effectiveness largely in terms of positive financial outcomes for the company (Boone et al. 2007; Coles et al. 2008; Linck et al. 2008; Upadhyay et al. 2014a,b).

Recent psychology literature offers experimental designs testing the effects of initial preferences and pressures of time, distraction and stress on group decisions (Kelly and Loving 2004). Electronic communications, which might improve both inclusiveness and efficiency, have advanced and the feasibility of online expert panels has been tested (Khodyakov et al. 2011).

Concepts from practitioner literatures about team building, based on the principles of Tuckman's model of teams forming, norming, storming, performing and adjourning, have since transferred into academic literatures (Bonebright 2010).

In addressing practical questions set by NICE this new review draws on all these literatures and presents current knowledge about the effectiveness and efficiency of committees first in terms of what works and how, and then in terms of frameworks, models and theories of how decision-making groups operate.

2. Review questions

The overarching question is:

What does the evidence tell us about the effectiveness and efficiency of committee work?

Sub-questions ask about:

1) Committee structure and environment:

- a) 'The optimal composition (e.g. topic generalists or specialists, past committee experience/ skills, demographics - gender, ethnicity, age) and size for decision-making committees, and the advantages and disadvantages of groups of different compositions and sizes (i.e. impact on the outputs and of decision making)?'
- b) The impact of environmental factors on committee work (e.g. layout, environment, acoustics, lighting, heating, air conditioning, spatial capacity)

2) Chairing:

- a) The most effective type of committee chair (competencies, skills e.g. topic specialists vs generalists)

3) Committee processes:

- a) The impact of meeting length, number and timing on committee work
- b) Effective and cost effective processes and structures for supporting committee decision making (for example, consensus techniques, decision support tools)
- c) How use of different media (e.g. videoconferencing, email) for committee interaction impact on decision making and costs
- d) Equity considerations associated with different committee structures and processes
- e) The impact of training on technical and engagement issues for committee chairs, committee members and secretariat.

3. Review methods

3.1 Stakeholder involvement

The questions for this review were posed by NICE to inform their own ways of working. However, these questions are applicable to committees generally, and especially groups that bring together a mix of people to consider highly technical issues for the benefit of a wider public. We therefore asked people with direct experience of working with committees, either in the health sector or in business administration, what the review should take into account when considering the effectiveness and efficiency of committees. Three experts were approached individually who, between them, had experience of guideline development groups, audit committees, and corporate or public sector boards. Other input was invited from forums and networks debating related issues (Twitter, and two LinkedIn groups on public involvement in research).

3.2 Approaching the literature

Systematic reviews for testing hypotheses about causal relationships answer closed questions. These questions, often asking 'Does it work?', begin with well-defined key concepts, typically framed as Population, Intervention, Comparator and Outcomes (PICO). The main principle underpinning their review methodology is avoiding bias. This is achieved in part by exhaustive search strategies. In contrast, open questions begin with few well-defined key concepts; instead clearly defining key concepts is part of the review process. The principles underpinning this approach are exploration for clarification and explanation. This is achieved in part by theoretical and purposive search strategies. What makes committees effective and efficient is a 'what works?' question. Such questions, which are outcome focused rather than intervention focused, fall between these two extremes of systematic reviewing where some key concepts are defined in advance and others are defined in the course of the review. Such reviews both make sense of a diverse literature and aggregate findings where similar studies are found (Gough et al. 2012).

This review is addressing an open question where the indicators for effective and efficient committees were not predefined, and the potential interventions are numerous (group composition, recruitment, training, facilitation). The search strategy was therefore designed to capture both the specialist guidance development literature, and a broader literature where studies may focus on different assumptions and key concepts, and adopt different definitions and research designs. As a rapid review it also required navigating sources of studies to identify quickly a range of relevant literatures.

Our search strategy started with three main approaches for quickly scoping relevant literatures: broad yet simple searches that cut across academic disciplines; searching a set of sources each of which targeted particular contexts or approaches to research; and searching for systematic reviews. A subsequent strategy of inspecting reference lists and searching for citations of eligible studies was chosen as a rapid way of identifying additional and similar, relevant studies.

The broad, simple searches were employed using (a) Google scholar, chosen for its potential reach and ease of use, and (b) the library at the London School of Economics, which catalogues social sciences material in the widest sense, with its collections being particularly rich in economics, statistics, political science and public administration. The targeted searches employed sources focused on guidance development (a central task of many NICE advisory groups) and on specific academic disciplines and organisations focused on committee work more widely.

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Judging the relevance of studies from titles and abstracts alone requires some familiarity with the traditions of publishing, yet these vary with study designs, publication outlets and academic disciplines. This familiarity was gained by inspecting full reports during scoping searches allowing eligibility criteria, initially based on the review questions alone, to be refined in light of the broad emerging literature.

This iterative approach deployed the characteristics recommended by Booth (2001) for qualitative systematic reviews: (a) identifying major "schools of thought"; (b) searching within a broad range of disciplines; and (c) using complementary electronic and manual search techniques.

3.3 Inclusion criteria

Evidence was eligible for inclusion in this review if it met at least one criterion in each of the following sets:

Populations:

- Committees that make decisions about highly technical matters and comprise a range of stakeholders, including people from outside of the organisation; or
- Facilitation of discussions and decisions about highly technical issues by mixed groups of people

Outcomes:

- Committee effectiveness, in terms of performance, including quality of decision-making; or
- Committee efficiency, in terms of performance within time or resource limits

Types of evidence:

- Frameworks, models or theories for understanding or assessing the performance of committees; or
- Empirical studies such as experimental studies, evaluations of interventions, surveys, case studies, observational studies, longitudinal studies to elucidate what works.

Only studies published in 1996 or later were included, although reviews of research referred to earlier studies. This date corresponds with the date of a search for consensus development studies by Murphy et al. (1998).

Studies were excluded if they:

- only addressed determinants of group structures or procedures
- only addressed performance of the host organisation and not the performance of the committee

3.4 Identifying and describing studies

An iterative approach to searching was adopted to gather evidence from different academic disciplines. The first step was identifying all of the relevant references cited in Murphy et al.'s (1998) multidisciplinary systematic review of consensus development; these were all published pre-1996 so were outside the inclusion criteria. However, these references were then entered individually into Google Scholar so that more post-1995 articles and papers that had cited these references could be examined to ascertain their relevance for this review. A number of more recent pieces of literature were identified using this process.

Following this, the reference lists of all pieces of literature that had been identified up to this point were examined to establish if there were any other relevant sources that had been missed. A saturation point was reached where no new relevant studies were being identified using this process.

Further pilot searches were also carried out using a number of different electronic bibliographic databases (Business Source Elite, ERIC, Google Scholar, IngentaConnect, JSTOR, ProQuest, PsychInfo, Science Direct, Wiley Online library SWETSWISE, SocIndex and the 'SUMMON' search facility via the LSE library system) using combining search terms such as: decision*, committee, board, panel, process*, procedur*, skill, competenc*, group decision-making, consensus method*.

During pilot searching, where search strings returned fewer than 200 hits, all hits were scanned for relevance. Where search string results numbered in excess of this the first 200 hits were scanned for relevance or fewer if it was evident that the articles were consistently of no relevance to any of the research questions.

A brief search was also made of the websites of a number of relevant organisations such as the Institute of Directors and the Chartered Institute of Professional Development for any useful documentation or guidance.

After pilot searches had identified approximately 30 articles, useful search terms identified from these and the eligibility criteria refined, further exhaustive electronic searches were conducted to capture literature published since a systematic review of guidelines development by Hutchings and Raine (2006).

Further details are available in appendices 1 and 2.

Search outputs and data analysis were managed by bespoke research synthesis software, EPPI-Reviewer (Thomas et al. 2010). Search outputs were initially screened by one researcher and then checked by another.

Broad literature searches at LSE library and electronic database searches were conducted by a single author (KH) who also made initial, over-inclusive, judgements about the eligibility of studies. These judgements were checked by another author (SO). Two authors with subject expertise in the area (SO, RB) also identified individual studies.

Included studies were described in terms of: the sub-questions they addressed; the literatures where they were found; and their methodological design. These details appear in Appendix 3.

3.5 Appraising evidence

All reports were appraised for their relevance to the overall review question and, where possible, matched to a specific sub-question. Their methods and findings were appraised for the type of evidence they offered.

We paid more attention to studies that had synthesised theoretical or empirical literature than to primary studies. When addressing each sub-question for this review we drew on literature reviews for which we could discern how authors had identified and selected studies, from clear or implied eligibility criteria and search strategies. For frameworks, models or theories to understand or assess the performance of committees we also drew on syntheses of literatures. Judgements about the type of synthesis were made by a single author (SO).

3.6 Synthesising evidence

To make the most of this extensive literature, we chose to focus our efforts on reviews that systematically drew together empirical research, or developed frameworks, models or theories from multiple studies.

The synthesis was conducted in two stages. The first stage synthesised findings for each review sub-question that had been reported by earlier systematic reviews. These findings offered evidence of what works, and presented explanations of what works.

The second stage synthesised findings from systematic reviews that offered frameworks for clarifying the meanings of 'effective' and 'efficient' when applied to committees, or models or theories to enhance understanding of decision-making groups.

4. Results: Stakeholder involvement

Seven stakeholders responded to our consultation. Three responded to direct, personal approaches. Four responded to queries posted to two discussion groups on LinkedIn (www.linkedin.com) which, between them, had more than 700 members. One responded to a query on Twitter (<https://twitter.com>). Holding senior or managerial appointments in the NHS, commerce, academia or the voluntary sector, they brought experience of guideline development groups, patient and public involvement in the NHS and research, corporate boards, audit committees and a public sector board of trustees.

They saw the role of the chair as key for keeping discussion on track and ensuring all relevant views are heard. Those familiar with patient and public involvement in health and social care emphasised the importance of: a shared vision; joint leadership or third party moderators/ facilitators; and group dynamics, including ground rules. Three mentioned the development of groups (their relationships and mutual trust) over successive meetings; two specifically mentioned Tuckman's four stages of group development. Also mentioned were the importance of key documents (timely agendas, appropriate papers, good minutes), a comfortable environment, refreshments and comfort breaks (which sometimes allow quiet one-to-one conversations), and the challenges non-specialists face in contributing to specialist committees.

These were not research findings. Rather, we drew on the issues they raised when commenting in the discussion section on the extent of the research literature.

5. Results: Description of studies

5.1 Identification of studies

Iterative searching identified 1320 items, 142 of which were duplicates. The remaining 1178 items were screened and 1072 were excluded, leaving 106 relevant items. The reasons for exclusion are provided in Figure 1.

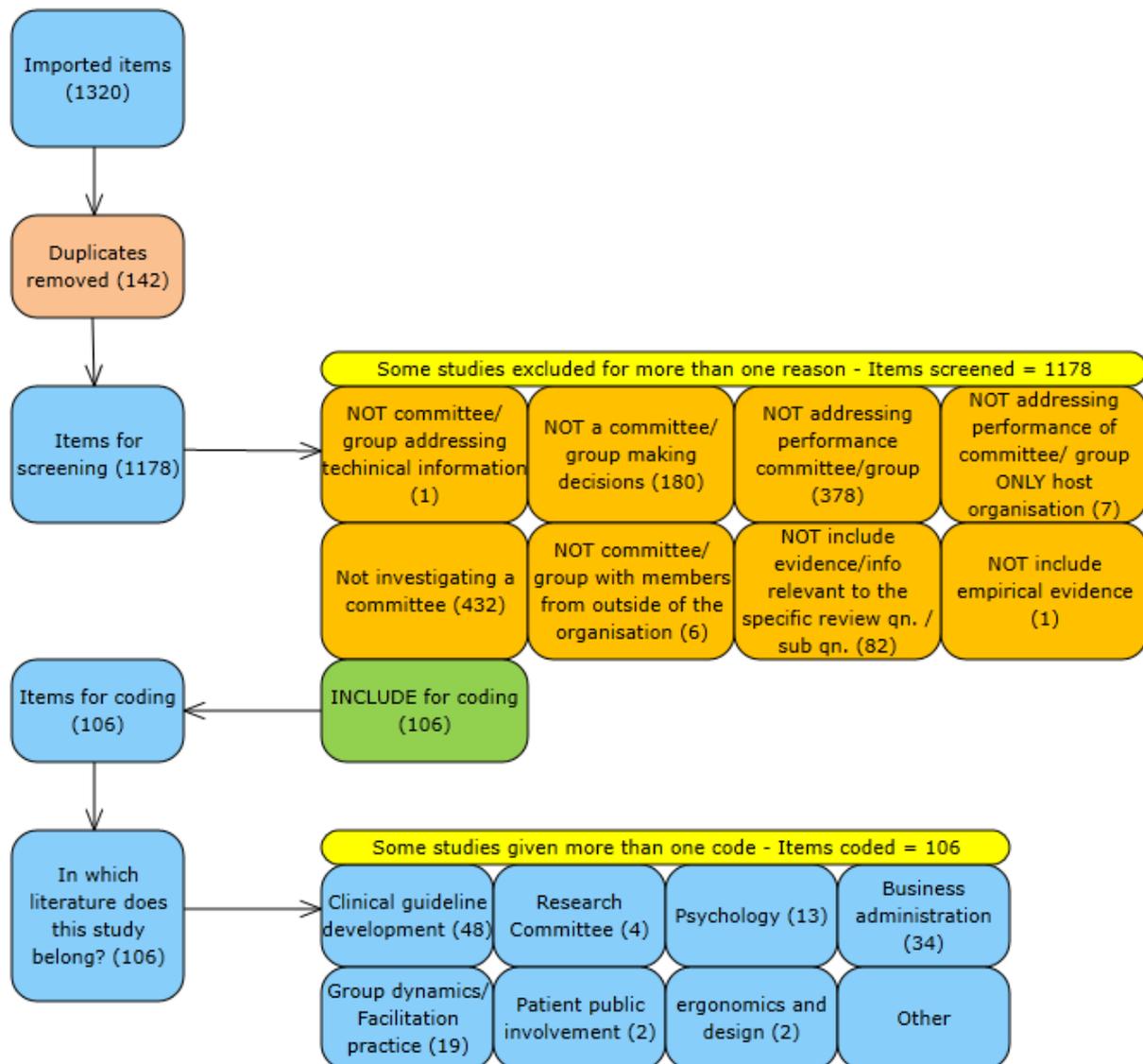
Of the 106 studies addressing the overarching question driving this review, the most common focus was the development of clinical guidelines (48). There were also significant literatures investigating committees within business administration (34), and the group dynamics or facilitation practices (19) or psychology (13) of group decision making (Table 1).

Table 1: Literatures identified by the search

Context of studies	Number
Clinical guideline development	48
Business administration	34
Group dynamics/ Facilitation practice	19
Psychology	13
Research Committee	4
Patient public involvement	2
Ergonomics and design	2

Studies of committees (rather than experimentally convened decision-making groups) came from two different areas: guideline development and business or public sector administration. These different settings housed different types of decision-making groups which varied in their composition and their responsibilities. Sector specific definitions are provided in Appendix 4.

Figure 1: Flow of studies from identifying titles to inclusion in the review



This literature included 60 primary studies (Table 2). The development of clinical guidelines was more often addressed by qualitative (14) and experimental designs (6), whereas business administration was more often addressed by observational studies (12). The most common studies addressing group dynamics or facilitation practice had experimental designs (11).

Table 2: Research designs identified by the search

Types of studies	Number
Literature reviews	47
Systematic review (two of these also developed a framework)	16
Systematic review of systematic reviews	12
Non-systematic review	11
Meta-analysis	1
Frameworks, models or theories based on multiple studies (two were also systematic reviews; one was tested with an association study)	9
Primary studies	60
Qualitative methods	21
Experimental design	18
Association study (one also tested a model based on multiple studies)	16
Theoretical/mathematical model	5

There were also many literature reviews (47) (Table 2). Some reviews were conducted systematically: 16 systematic reviews (one of these was underway at the time of this review); and 12 systematic reviews of systematic reviews. Some reviews (9) drew on the literature to develop frameworks, models or theories for assessing or explaining the effectiveness or efficiency of group decision making.

Different methods tended to be adopted to investigate clinical guideline groups and business committees (Table 3). The evidence on developing clinical guidelines was generally identified within systematic reviews (6) and reviews of reviews (12), as well as some qualitative and experimental studies. Systematic reviews (6) were also found in the business administration literature, as were most reviews developing frameworks or models (9), and observational studies (12).

Table 3: Included studies: questions and study designs

Code	Clinical guidelines	Research committee	Psychology	Business administration	Group dynamics/ facilitation practice	Patient and public involvement	Ergonomics and design
Experimental design	6	0	4	1	11	0	0
Systematic review	6	1	3	6	2	1	0
Systematic review of systematic reviews	12	0	0	0	0	0	0
Meta-analysis	0	0	0	0	0	0	1
Non-systematic review	7	0	4	3	2	0	0
Observational study	1	1	0	12	1	1	0
Qualitative methods	14	2	2	3	2	0	0
Theoretical/mathematical model	1	0	0	3	1	0	0
Development of a framework/ model	0	0	0	9	0	0	0

5.2 Research syntheses

Most of the evidence identified for this review was found in the area of guideline development (Table 1), and tended (as described above) to be review-level evidence (see Table 3). Consensus development for clinical guidelines was systematically reviewed by Murphy et al (1998). They conducted an exhaustive search across academic disciplines in 1996. They stratified the evidence underpinning their recommendations as: clear research evidence; limited supporting research evidence; and experienced common-sense judgement. Their review was updated by Hutchings et al (2006) who searched the literature from 1996-2004. The updated review only included studies which formally compared different groups.

In 2006 a series of systematic reviews of systematic reviews was conducted for the World Health Organisation. They cited Murphy et al. (1998). Where systematic review evidence was lacking they cited other studies, without explaining how these studies were selected, or relied on 'logical arguments and the experience of other organisations' (Fretheim et al. 2006a).

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Kunz et al. (2012) updated two reviews from this series on group composition and group process (Fretheim et al. 2006a and b). Kelson et al. (2012) conducted a similar systematic review of systematic reviews about integrating values & consumer involvement in COPD guidelines, which also drew on Murphy et al. (1998).

At the time of writing, a Cochrane systematic review was underway that addresses the association between personal conflicts of interest and recommendations on medical interventions (Lundh et al. 2013).

The latest systematic search for guidelines development literature was in 2004 (Hutchings et al. 2006). The latest systematic search for systematic reviews of guideline development was conducted in the latter half of 2005 for a series of systematic reviews of reviews published in 2006 (see Figure 2).

Other empirical literatures reviewed systematically include:

- Audit committee effectiveness (DeZoort et al. 2002)
- Computer-Mediated Communication & Group Decision Making (Baltes et al. 2002)
- Consumer involvement in R&D agenda setting (Oliver et al. 2004)
- Group decision-making, information sharing & time (Reimer et al. 2010)
- Corporate boards (Jonsdottir 2010) and NHS Boards (Ramsay et al. 2010)
- Health & Safety committees (Yassi et al. 2013)
- Health facility committees in low- and middle-income countries (McCoy et al. 2012)
- Training and development of boards and their members (Ward and Preece 2012)
- Patient and public involvement in quality indicator development (Kotter et al. 2013)

An additional synthesis was a statistical meta-analysis addressing environmental factors and worker performance (Oseland and Burton 2012).

Between them these empirical syntheses addressed all of the questions posed by NICE (Appendix 3).

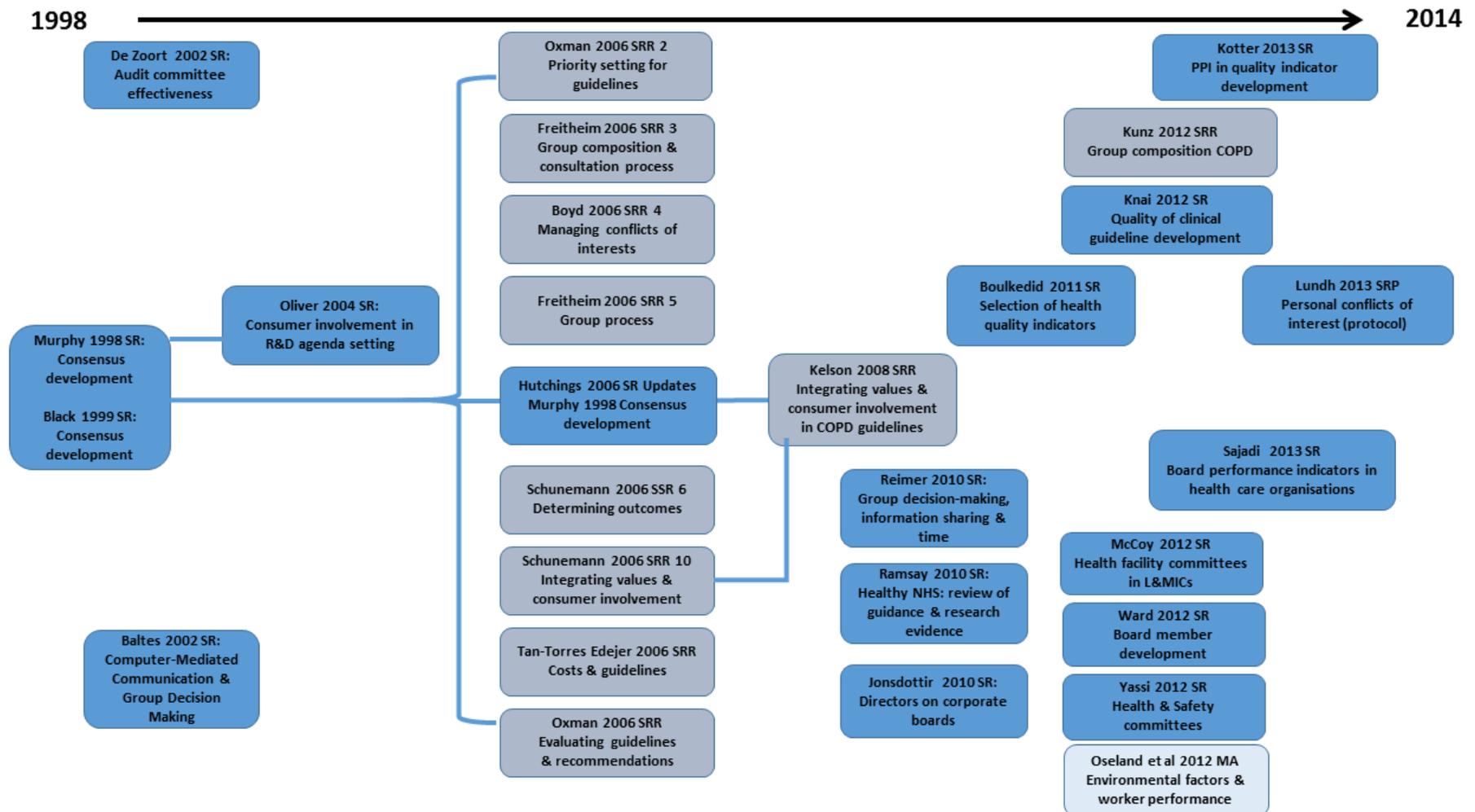
Literatures synthesised to develop frameworks, models and theories addressed:

- Asymmetry of information during group decision making (Brodbeck et al. 2007)
- Board and Organisational Performance in Nonprofit Organisations (Brown 2005)
- Audit committee effectiveness (DeZoort et al. 2002; Mohiuddin 2010)
- Boards of directors, group dynamics and workgroup effectiveness (Forbes and Millikan 1999)
- Board task performance (Minichilli et al. 2009)
- Indicators for evaluating board performance (Sajadi et al. 2013)
- Shared leadership and board task performance (Vandewaerde et al. 2010).

These studies provided some explanations for committee effectiveness and efficiency.

Details about each research synthesis appear in Appendix 5.

Figure 2: Systematically synthesised literatures



6. Results: Synthesis of findings

The review findings are presented in two formats. The first takes each review question in turn and summarises the evidence of what works, followed by studies offering explanations. The second takes a more holistic approach, drawing on frameworks, models, and theories that have been developed from synthesising studies to understand committee performance and decision-making.

6.1 Committee structure and environment

1a) *'The optimal composition (e.g. topic generalists or specialists, past committee experience/ skills, demographics - gender, ethnicity, age) and size for decision-making committees, and the advantages and disadvantages of groups of different compositions and sizes (i.e. impact on the outputs and of decision making)?'*

Evidence of what works

The effectiveness of committee composition has been investigated in terms of the diversity, expertise, specialities and independence, as well as the group size.

Diversity

Much of the evidence about diversity in group composition came from social and organisational psychology (some of it from business administration), reviewed by Murphy et al. (1998). Group members varied in terms of their demographic characteristics (e.g. age, gender, cultural and occupational background); their abilities, expertise and status; and their initial opinions. Such diversity has been seen as valuable for bringing different perspectives and a wider variety of alternatives for consideration. Within banking, teams which varied in terms of their education and functional expertise have shown greater strategic clarity than more homogenous teams (Bantel 1993a; 1993b in Murphy et al. 1998). This observation was confirmed by other studies showing an association between diversity and performance (Murphy et al. 1998 citing: Murray 1989; Wiersema and Bantel 1992). Jackson (1992) (in Murphy et al. 1998), when reviewing organisational literature, found that teams with members bringing different personal attributes performed better, but evidence was more limited about teams with members bringing different skills and abilities.

Expertise

Within the consensus development literature there was support for having group members who are credible experts (Murphy et al. 1998 cite: Fink et al. 1984; Jones and Hunter 1995; Lomas 1991). For guideline development groups, credible expertise comes from clinicians, researchers and lay people or patients bringing expertise from having experienced the impact of the condition or intervention. Representatives from all of these 'expert groups' may be required. However, a recent systematic review of guideline development groups in Europe (Knai et al. 2012) has found that the involvement of stakeholders (providers and patients) remains limited. Including lay people in committees was supported by evidence from beyond guideline development, about the effectiveness of workplace health and safety committees. This literature has found an association between greater worker involvement in these committees and lower lost-time claims and fewer reported injuries and illnesses (Yassi et al. 2013: citing Geldart et al. 2010; Eaton and Nocerino 2000).

Topic specialities

Murphy et al. (1998) found that specialists tended to favour interventions within their

sphere of practice. This was apparent in studies comparing: groups of surgeons with groups of mixed relevant specialists (Scott and Black 1991a; and Leape et al. 1992a; both in Murphy et al. 1998); groups of chiropractic physicians with doctors from other specialities (Coulter et al. 1995, in Murphy et al. 1998); service users with clinicians (Lomas et al. 1987, in Murphy et al. 1998); generalists, specialists and surgeons (Park et al. 1986; Brook et al. 1988; both in Murphy et al. 1998); and medical specialists with surgeons (Fraser et al. 1993 in Murphy et al. 1998). Similar differences have been found using the Delphi method, both inside and outside the health sector (Murphy et al. 1998 citing: Cannon et al. 1992; Hakim and Weinblatt 1993; Kastein et al. 1993; Zadinsky and Boettcher 1992; with one exception, Tepper et al. 1995) where discussion focused on different payment methods for inpatient rehabilitation.

These findings were confirmed with another systematic review eight years later (Hutchings and Raine 2006), which reported studies comparing: surgeons and cardiologists (Bernstein et al. 2001); purchasers, providers and users (Michie et al. 1998); and ‘doers’ and ‘non-doers’ of procedures (in many studies using RAND/UCLA method (Coulter 2001)). However, some of their included studies showed less difference when comparing: different specialities (Landrum et al. 1999); surgeons and gastroenterologists (Quintana et al. 2002); consumers, providers, payers and researchers rating criteria for payment methods in rehabilitation (Tepper et al. 1995); health care workers and family members for oral health care outcomes in dementia (Jones et al. 2000); and providers and community leaders considering health priorities in Switzerland (Schopper et al. 2000); and clinicians differing in age, years since specialist training and school of specialist training in addition to specialty (Tepper et al. 1995). This review also found that individuals from groups that were subject to performance criteria were more critical of those criteria than individuals from other groups (Kastein et al. 1993; Campbell et al. 1999).

On balance:

Practitioners who perform a procedure tend[ed] to emphasise the appropriateness of the procedure compared with non-performing practitioners, and individuals from groups that were subject to performance criteria [were] more critical of those criteria than individuals from other groups. (Hutchings et al. 2006)

Murphy et al. (1998) investigated the extent to which a group decision may be affected by the particular individuals who participated. They concluded that individual members had little influence given that similarly composed guideline development groups came to similar conclusions, although findings were weak as they drew from small studies comparing few groups (Murphy et al. 1998, citing: Kastein et al. 1993; Duffield 1993; Chassin 1989; Pearson et al. 1995). The update of this review (Hutchings et al. 2006) found little difference in decisions between similar groups convened in different geographical contexts: Australian breast cancer centres (Redman et al. 1997); Italian regions for breast cancer surgery (Penna et al. 1997); and different hospitals providing emergency care (Hotvedt et al. 2003).

Hutchings and Raine (2006) concluded that ‘except for participant specialty there is little generalizable evidence for how the characteristics of participants and groups influence the judgements produced in formal consensus development methods’. It recommended multi-specialty groups over single specialty groups in order to take account of a wider range of opinion. At the same time, a review of existing systematic reviews and relevant methodological research reported empirical evidence suggesting that panel composition

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has an impact on the content of the recommendations that are made, but found limited research evidence to guide the exact composition of a panel (Fretheim et al. 2006a).

Independence

A corollary to specialisms and expertise, is independence of group members in relation to the decision being made. Although independence received little explicit attention in the guideline development literature, it has been noted that 'editorial independence', in which 'the guideline is editorially independent from the funding body' was the quality domain least well addressed by guideline development groups for managing chronic disease in Europe (Knai et al. 2012)

Independence of group members received more emphasis in the business management literature. The major U.S. stock exchanges required that audit committees be composed of at least three independent, financially literate directors (DeZoort 2002). Similarly, prescriptive studies of board effectiveness advocated the membership of independent, high quality individuals with diverse backgrounds and knowledge (Jonsdottir (2010) cited: Finkelstein and Mooney 2003; Leblanc and Gilles 2005; Nicholson and Keil 2004; Letendre 2004; Leblanc 2004a). Although the proportion of non-executive directors has grown following guidance to this effect, no evidence of benefit has been found, even for independence of chairs (Ramsay 2010 citing Selim et al. 2009, Ferris and Yan 2007).

Size of group

When rating the quality of medical care reliability increased significantly with increasing numbers of participants from 1 to 10, but then tailed off; but, on average, 16-28 judges were required to produce 'a composite judgement of the quality of care for a single case with a reliability of 0.95' (Richardson 1972, cited in Murphy et al. 1998). Murphy et al. concluded that 'below about six participants, reliability will decline quite rapidly, while above about 12, improvements in reliability will be subject to diminishing returns'.

Explanations

Skills and experience

Selection and appointment were seen as important process indicators in two systematic reviews of health boards (Zakus and Lysack (1998) in McCoy et al. 2012; Sajadi et al. 2013).

Both guideline development and business administration literatures focused on group composition - getting the right mix of skills and experience around the table - as an indicator of effective groups. Within business administration, the aim was to convene committees with skilled members having adequate information and a clear understanding of their role and the specific conditions of the company (Jonsdottir 2010).

For guideline development, multidisciplinary groups were chosen to bring a breadth of opinions, experience and knowledge of the issues under discussion in order to develop workable recommendations, and to facilitate stakeholder participation and ultimately guideline acceptability and implementation (Murphy et al. 1998; Pagliari et al. 2001). In other words, broad membership was likely to ensure that all relevant scientific evidence was found and critically appraised, that potential practical problems arising from using the guidelines would be identified and addressed, and a sense of involvement or ownership built among different audiences for the guidelines (Field and Lohr 1990 cited in Fretheim, 2006a).

Murphy et al. (1998) found evidence that participating in a mixed rather than single-specialty group, even without face- to-face contact, has had a moderating effect on their

differences (Campbell et al. 1999; Coulter et al. 1995). This drew their suggestion that participants learned from colleagues in other specialties during the consensus process, making multi-specialty groups preferable to single-specialty groups.

Legitimacy was seen as an important characteristic of members of health facility boards (McCoy et al. 2012 citing Sepheri and Pettigrew 1996; Ramiro et al.. 2001; Mubyazi and Hutton 2003; O'Rourke et al.. 2003; Loewenson et al.. 2004; Sohani 2005). In particular, 'the methods used to select organisation members and the degree to which they represent... issues [were]...crucial in determining the perceived legitimacy of the representatives in the eyes of the population served' (Lysack 1998 in McCoy et al. 2012).

Prior knowledge and opinion

The influence of topic specialties highlights the importance of members' initial knowledge and opinions. Murphy et al. (1998) reviewed the relevant literature on prior opinion. Majority opinion generally held sway. Yet minority views have been influential, possibly improving the quality of the decision-making by stimulating divergent thinking, although evidence was not strong, particularly for complex tasks (Murphy et al. 1998, citing Davis et al., 1975; Maass and Clark 1984; and Nemeth 1992). Where initial individual judgements were homogenous, final group judgements could be more extreme, particularly if the initial viewpoint was opposed by a minority (Murphy et al. 1998, citing Williams and Taormina 1993). However, if judgements were more evenly split initially, groups either moved towards each other's position, or each group became more cohesive, leading to polarisation and possibly conflict (Murphy et al. 1998, citing Vinokur and Burnstein 1978a; 1978b; Whitney and Smith 1983).

More recently, a systematic review and meta-analysis of 'laboratory studies', where prior knowledge was manipulated, reported that groups often focus their discussions on information that all members knew at the outset (Reimer et al. 2010). Where information was shared unevenly at the outset, so that individual members uniquely held some information, that 'unshared information' was mentioned much less often in discussions than information that was known to all members in advance. To some extent this was a matter of chance. If every member mentioned once both the prior shared and prior unshared information they held, the shared information would be mentioned multiple times while unshared information would only be mentioned once. When tested, the difference was less as, on average, about half of the shared and two-thirds of the unshared information went unmentioned during discussions. Favouring the discussion of shared information was less in the following circumstances:

- where choosing a logically preferred outcome required sharing uniquely held information, compared with choosing between equally attractive solutions
- where there were few alternatives to choose between (discussing only two alternatives rather than three or more);
- when discussion time was reduced (less than 30 minutes compared with at least 30 minutes).

Conflict and tasks

Increasing heterogeneity did not necessarily lead to better performance (Murphy et al. 1998, citing: Guzzo and Dickson 1996; Maznevski 1994). Heterogeneity could raise the likelihood of conflict, which in turn could reduce or raise performance (Murphy et al. 1998, citing: Schweiger et al. 1989; Schwenk and Cosier 1993); with reduced performance possibly arising around discussions of routine tasks, but with discussion of non-routine

tasks benefiting from more open discussion and critical evaluation of problems (Murphy et al. 1998, citing Jehn 1995).

Independence

Despite the lack of evidence (mentioned above) linking independence with committee performance, the importance of all non-executive directors who sit on Audit Committees having independent status was confirmed by research informing NHS Boards. Bronson et al. 2009 (cited in Ramsay et al. 2010) suggested that only under such circumstances were the benefits of having an Audit Committee obtained, for example in terms of monitoring performance and ensuring that external auditors were not unduly influenced by management. Independence was valued across the spheres; independence of the editorial process in guideline development (Knai et al. 2012); independence of corporate boards with more outside directors, and separating the roles of chairman and chief executive officer (Jonsdottir 2010).

A systematic review is underway within the Cochrane Collaboration (Lundh et al. 2012) investigating a related question: whether authors of scientific opinion pieces with personal financial conflicts of interest related to drug, device or medical imaging companies are more likely to recommend the companies' products. Interim results, after five studies had been identified, presented at the Cochrane Colloquium in 2013 suggested a statistically significant association, although there was considerable heterogeneity across different domains of studies.

Size of group

Theoretical studies that manipulated assumptions about true or correct values and error concluded that raising group numbers above ten did little for group validity or assessments of error, and differences were small and difficult to detect (Murphy et al. 1998, citing: Hogarth 1978; Huber and Delbecq 1972). In practice, counteracting the advantage of larger numbers may be less equal participation of members (Shaw 1981, in Murphy et al. 1998). Murphy et al. (1998) concluded:

In general, having more group members will increase the reliability of group judgement. However, where the group members interact, large groups may cause coordination problems within the group. Although it is theoretically likely that group size will affect decision-making, the effects are subtle and difficult to detect. It seems likely that below about six participants, reliability will decline quite rapidly, while above about 12, improvements in reliability will be subject to diminishing returns.

Box 1: Key conclusions about composition and size of decision-making groups

- Having **more group members** will increase the reliability of group judgement but large groups may result in co-ordination problems. Below about six participants, reliability will decline quite rapidly, while above about 12, improvements in reliability will be subject to diminishing returns.
- To enhance the legitimacy of the group and the credibility and widespread acceptance of the guidelines, it is probably wise that membership reflects the **full range of key characteristics** of the population of experts from which the participants are drawn. **Independence** of financial implications of decisions is also valued.
- The weight of evidence suggests that groups with more **varied membership** perform better, particularly for non-routine tasks, although conflict may arise

between diverse participants.

- Members are more likely to advocate techniques that involve their **specialty**.
- Their **initial opinions** may affect the group process. Initial consensus may be followed by a shift to a more extreme decision. Alternatively, following an initial split view, members will either move towards one another's views or cohesive subgroups may form to polarise views.
- The selection of individuals (from within a population) has some, though not a great deal, of influence on outcome.

1b) *The impact of **environmental factors** on committee work (e.g. layout, environment, acoustics, lighting, heating, air conditioning, spatial capacity)*

Evidence of what works

The most closely related synthesised literature was a meta-analysis (albeit with limited searching) which addressed environmental factors and worker performance, but none of the activities included group decision-making (Oseland and Burton 2012). An ergonomics researcher confirmed a similar lack of primary studies.

Explanations

Murphy et al. (1998) rated evidence about environmental factors as 'experienced common-sense judgement' and concluded that 'a comfortable environment for meetings is likely to be preferred by participants and to be conducive to discussion.'

Box 2: Key conclusions about the impact of environmental factors

- There is a lack of evidence about the impact of environmental factors on group decision-making
- The findings from ongoing research on group creativity are not yet available.

6.2 Committee chairing

2a) *The most effective type of **committee chair** (competencies, skills e.g. topic specialists vs generalist)*

Evidence of what works

Murphy et al. (1998) reviewed the literature about group leaders, both chairs and group facilitators. Experimental studies showed that facilitators can help groups to generate more ideas by encouraging members to express diverse opinions, especially if they delay expressing their own opinion (Murphy et al. 1998 citing: Anderson and Balzer 1991; Flowers 1977; Maier and McRay 1972; Maier and Sashkin 1971).

Explanations

Murphy et al. (1998) found qualitative studies suggesting that a facilitative chairperson is key to a successful consensus conference (Vinokur et al. 1985; Wortman et al. 1988). Findings from the studies suggested that the chairperson facilitates the exchange of relevant information by regulating the interaction and decision procedure. 'This may explain why studies have found that the Nominal Group Technique, which involves a trained facilitator, is superior to informal groups despite the latter requiring effective chairing' (Murphy et al. 1998).

Clawson and colleagues (1993, cited in Murphy et al. 1998) identified a range of roles for facilitators including providing structure for the group interaction, maintaining the agenda, recognising speakers, focusing the group on the outcome, managing conflict, and creating a positive environment. A facilitator may enhance group processes and cohesion (Anson and colleagues 1995, in Murphy et al. 1998) or even raise the quality of decisions (George et al. 1992, in Murphy et al. 1998).

More recently, the importance of leaders in decision-making groups has been addressed in a systematic review of the experiences and activities of directors and non-executives on corporate boards of directors. Jonsdottir (2010) cited studies reporting corporate boards being reliant on the crucial role of board leaders for creating inclusive working procedures and an atmosphere of openness, dialogue and trust (Lorsch and McIver 1989; Kakabadse et al., 2006a; Nadler et al., 2006; Pye 2000, 2001b).

Analysis of evaluation studies reveals the strength and effectiveness of the board chair as an important indicator for board performance (Sajadi et al. 2013, citing NHS Confederation, 2005; Fletcher 1991; Kane et al., 2008). Within the corporate domain, effective board chairs 'add value by supporting relationships - with investors and colleagues - and by contributing intellectual and ethical input in Board discussions' (Ramsay et al. (2010), citing Dulewicz et al. 2007). The Chair's performance is appraised at least annually by non-executive directors who also listen to the views of executive directors (Ramsay et al. (2010), citing Financial Reporting Council 2008). Similar processes are recommended within the NHS (Ramsay et al. (2010), citing Monitor 2006, Appointments Commission 2003).

Box 3: Key conclusions about the competencies of effective chairs

- There is little rigorous evidence about what makes an effective chair
- Facilitators can help groups to generate more ideas through encouraging members to express diverse opinions and by delaying expressing their own opinion
- Corporate board leaders have a crucial role in establishing inclusive working procedures and an atmosphere of openness, dialogue and trust.

6.3 Committee processes

3a) *The impact of meeting length, number and timing on committee work*

Evidence of what works and an explanation

A study comparing small groups tackling planning tasks under different time pressures was reviewed by Murphy et al. (1998). When working within time constraints groups focus on completing the task, which can lead to their initial preferences having more influence on both the group discussion and decision. With moderate time pressure, groups focused more on the quality of the output, and attended more carefully to the information. (Murphy et al. 1998, citing Karau and Kelly 1992).

As mentioned above, a systematic review of similar studies concluded that such small group discussions focused more on information held by every member in advance, rather than information held by a single member. However, this difference was less when the group had less than 30 minutes for their task (Reimer et al. 2010).

Box 4: Key conclusions about the timing of committee work

- When time is short initial preferences have more influence
- When time is short, members' discussion bias towards information they all hold in advance is lessened

3b) Effective and cost effective processes and structures for supporting committee decision making (for example, consensus techniques, decision support tools)

Evidence of what works

Consensus methods

In their systematic review, Murphy et al. (1998) paid close attention to consensus methods for decision making, particularly Nominal Group Technique (used with groups meeting face-to-face) and Delphi Method (used with groups dispersed geographically, and considered in the section below). Nominal Group Technique involves successive steps of members noting their initial ideas in private, expressing ideas one-by-one in turn, discussing the ideas and then voting in private. Further rounds of discussion and voting may follow. In practice, the technique is frequently modified. Murphy et al. (1998) found ten studies comparing Nominal Group Technique with informal decision-making methods. Variation between studies in how the technique was applied makes it difficult to draw strong conclusions. However, in general in studies which used facilitators and which stayed closest to the original format, the NGT tended to perform better (Murphy et al. 1998 citing: Brightman et al. 1983; Herbert and Yost 1979; Jarboe 1988; White et al. 1980).

Provision of information

When updating the original systematic review, Hutchings et al. (2006) reported a study considering information provision and resource constraint for implementation. Raine et al. (2004) found that providing groups with the review literature resulted in decisions closer to the available research evidence, but assumptions about ideal or realistic resources made no difference.

Explanations

Murphy et al. (1998) conclude that the formal methods of Nominal Group Technique and Delphi method 'generally perform better than informal ones and thus may be better for consensus development. Although the reasons why they perform better are not clear some aspects that are likely to be important include

- (1) ensuring that all members have a chance to voice their views,
- (2) ensuring that all options are discussed,
- (3) providing feedback and repeating the judgement,
- (4) ensuring that judgements are made confidentially.

Dynamics of mixed groups

The guideline development literature recognises the importance of broad stakeholder membership but largely ignores the challenges arising from broadening members to include service users. This challenge is addressed in a systematic review of research agenda setting (Oliver et al. 2004). It cited an earlier studied reporting problems arising with negative attitudes of some professional members, time pressures and language barriers and a need for appropriate recruitment, support and training, and facilitated democratic processes in order to confront tensions (Oliver 1998).

A systematic review provides a rich picture of directors' experiences and activities on corporate boards (Jonsdottir 2010). They normally sought consensus without open questioning or challenges to addressing their differences in opinions or perspectives in the boardroom (Hill 1995; Lorsch and McIver 1989). Other studies cited by Jonsdottir (2010) encourage challenging and constructive conflict (Finkelstein and Mooney 2003; Roberts et al. 2005), teamwork, common sharing of goals, active engagement and openness (Nadler 2006; Finkelstein and Mooney 2003; Pettigrew and McNulty 1995). More emphasis was placed on the need to understand board relationships, interactions, teamwork and decision making, specifically the interaction between individual board members and the collective experiences of the board as a group.

Achieving good decisions

The objectives of consensus development methods may be either 'to arrive at a single statement or set of statements that all participants accept (or at least no one disagrees with strongly enough to veto the agreement)... or to identify any 'central tendency' among the group and the degree of spread of opinion around it'. The former requires an attempt to facilitate consensus and the latter attempts to describe the level of agreement (Black et al. 1999).

For guideline development groups, good decisions have been described in terms of:

- Concordance with the scientific evidence, the extent of agreement within a decision-making group, the change of judgment between rounds of discussion and voting (for Delphi studies and Nominal Group Technique), and the extent of agreement between similar groups, which is taken as a measure of reliability of the methods (Hutchings 2006)
- A decision that ensures high standards of care and conserves resources (Hopthrow 2011).
- Recommended procedures where the benefit to the patient outweighed any risk by a sufficient margin to make the procedure worth carrying out (Coulter 2001 in Murphy 1998).
- Clinical guidelines with: clinical applicability, clinical flexibility, clarity, scheduled review, dissemination, implementation and evaluation (Oxman 2006d).

Box 5: Key conclusions about effective processes and structures for supporting group decision making

- In general, formal consensus methods such as NGT (especially when using a group facilitator and staying close to the original format) and the Delphi method perform better than informal techniques and tend to be better for consensus development.
- Providing groups with the review literature may result in decisions which are closer to the available research evidence.
- Having broad stakeholder membership (including service users) can lead to more effective decision making but appropriate recruitment, support and training is necessary to assuage professional tensions and to facilitate a democratic process.
- Elements of effective group processes from the corporate sphere have been found to include challenging and constructive conflict, teamwork, common

sharing of goals, active engagement and openness.

- The business management literature places greater emphasis on structures, recruitment of members and performance evaluation and less on the structured decision making methods emphasised in the guideline development literature.
- Conflicts of interest should be ascertained and the appointment of group members based on objective and explicit criteria.
- Quality of decision-making can be assessed in terms of: the accuracy of decisions; the degree of consensus within the group; the attitude of the group towards the processes and the decisions; and the implications of decisions in terms of organisational performance (governance, effective and efficient service, public confidence).

3c) How use of different media (e.g. videoconferencing, email) for committee interaction impact on decision making and costs

Evidence of what works

Much of the evidence about using different media came from comparisons of Delphi studies (conducted with group members geographically disparate) and Nominal Group Technique (conducted with group members face-to-face). Two systematic reviews (Murphy et al. 1998; Hutchings et al. 2006) compared Delphi studies with informal methods and the Nominal Group Technique. Murphy et al. (1998) found studies comparing Delphi with informal methods were inconsistent in their findings. They found seven studies comparing Nominal Group Technique with the Delphi method, again with inconsistent results and ‘no clear pattern as to what type of tasks or particular aspects of the procedure might be more or less important in producing these differences’. Hutchings and Raine (2006) found limited evidence that groups that met were more likely to rate procedures favourably than groups that made decisions by mail only.

The use of computer aided communication (email and ‘chat’) for group decision-making was systematically reviewed twelve years ago. At that time, results suggested that ‘computer-mediated communication leads to decreases in group effectiveness, increases in time required to complete tasks and decreases in member satisfaction compared to face-to-face groups’. Baltes et al. 2002). The authors cautioned against saving time and travel costs given the potential for poorer decisions.

Explanations

Inconsistent results with Delphi studies may not be surprising as these studies varied in terms of the group tasks, the number of feedback rounds (between one and six), the type of feedback given (results of voting alone or additional information about group members’ views), and the physical location of group members, with or without direct communication (Murphy et al. 1998).

Similarly unsurprising were the inconsistent results when comparing the Delphi method with Nominal Group Technique. The Delphi method can accommodate larger and geographically-dispersed groups while avoiding the risk of individuals exercising undue influence in meetings, but the Nominal Group Technique provides opportunities more for discussion and resolving differences of opinion.

Murphy et al. concluded that

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formal methods generally perform as well or better than informal methods but it is difficult to tell which of the formal methods is best. Formal techniques are said to work because they provide structure to the interaction, though which aspect of the structure is the most important is less well understood. Many studies did not operationalise the technique in a consistent way. Hence, it is difficult to decide which formal technique performs best.

Video-conferencing and teleconferencing were not included in the meta-analysis of computer-aided communication (Baltes et al. 2002) because there were so few studies. Given recent developments in Information and Communications Technology (ICT), more may be learnt from subsequent primary studies addressing: Web-conferencing as a viable method for group decision research (Handgraaf 2012); Human computation as a new method for evidence-based knowledge transfer in Web-based guideline development groups (Heselmans 2013, reporting a proof of concept randomized controlled trial); online expert panels (Khodyakov 2011, reporting a feasibility and experimental replicability study); virtual expert panels: formulary decision-making in the 21st century (Knudsen 2005); Delphi and snow card techniques to build consensus among diverse community and academic stakeholders (Rideout 2013); and the role of communication medium in group decision making and perceived success (Roch 2005).

Box 6: Key conclusions about the use of media for committee interaction and decision making

- There is no clear difference between the effectiveness of the Delphi method and Nominal Group Technique, although the former may prevent undue influence by individuals, and the latter may provide better opportunities for discussion.
- Computer-mediated communication takes longer and reduces member satisfaction compared with face to face meetings

3d) Equity considerations associated with different committee structures and processes

Evidence of what works

There is little evidence to suggest that diversity of board membership leads to improved effectiveness (Ramsay et al. citing Selim et al. 2009).

Explanations

The available empirical evidence relates largely to how groups work. Murphy et al. (1998) reviewed studies, largely laboratory-based, looking at group members' status, expertise or initial position. Within small groups, people with higher status tended to try, often successfully, to influence the group more (Murphy et al. 1998, citing Levine and Moreland 1990). At six consensus conferences, three roughly equal groups of members were distinguished in terms of their participation: actively and continuously participating; intermittently participating; and participating little (Murphy et al. 1998, citing Vinokur et al. 1985). Degree of participation was related to participants' status or relevance of their expertise to the issues.

The influence of status on decisions may depend on the nature of the task. Kirchler and Davis (1986, cited by Murphy et al. 1998) found that groups undertaking judgemental tasks tended to go with majority opinion where members' status was equal or similar. When status was unequal, higher status members sometimes had greater influence over

judgements, but for intellectual tasks whoever found the correct answer had most influence regardless of status.

The impact of gender on group dynamics and influence has been investigated within the context of corporate boards (Jonsdottir 2010). It appears that non-inclusive cultures limited the influence of women directors unless they were willing to make alliances with the most influential board members; they were also very well prepared and employed challenging questions as their main contribution (Jonsdottir 2010, citing Huse and Solberg 2006). Although qualitative studies addressed women directors' experiences of masculine board culture and ways to adapt to it or confront it, little is known about women's experiences as non-executive directors (Jonsdottir 2010, citing: Bilimoria and Huse 1997; Fondas and Sasselos 2000; Zhelechowski and Bilimoria 2003; Huse and Solberg 2006).

Box 7: Key conclusions around issues of equity

- In smaller sized groups, members with higher status/expertise/initial position often exerted more influence over the group.
- At consensus conferences, depending on their status and relevant expertise people have participated: actively and continuously; intermittently; or little.
- The influence of women on corporate boards was limited unless they make alliances with the most influential members; women tended to have more influence when they were well prepared and employed challenging questions as their main contribution.
- Groups undertaking judgemental tasks tended to go with the majority opinion where members' status was equal or similar. When status was unequal, higher status members sometimes had greater influence over judgements, but for intellectual tasks whoever found the correct answer tended to have most influence regardless of their status.
- The commercial and public sectors encourage diversity in boards but there is little evidence that it improves effectiveness.

3e) The impact of training on technical and engagement issues for committee chairs, committee members and secretariat.

Evidence of what works

Most evidence about training comes from a systematic review of the training and development of executive and non-executive board members within the public and voluntary sectors, in particular within UK social housing associations (Ward and Preece 2012). This review found that more emphasis was placed on recruiting people with appropriate knowledge and skills than on training and development for board members. Yet, 'training and development is important for all board members, both to develop people's skills where required and to help the board work well as a unit' (Audit Commission 2003, cited in Ward and Preece 2012). Development activities were largely ad hoc and informal (Ward and Preece 2012, citing: Jackson et al. 2003; Dalziel 2010). There were a few exceptions. One was a 'Non-Executive Director Award' scheme, which used coaches and succession planning and had a separate category for not-for-profit and public organisations, and recommended external facilitators or consultants with a Human Resources background for support and developmental roles, including performance appraisals of board members (Dulewicz and Taylor 2007; cited in Ward and Preece 2012). A coaching and teaching programme that appeared to improve the effective governance of

Boards in the USA was considered too expensive to be applied routinely (Holland and Jackson (1998), cited in Ward and Preece 2012). Noted in the same review was a UK university-organisation partnership (www.derby.ac.uk/corporate/clients/trent-and-dove/) which provided training for people interested in becoming a Board member, with modules such as: 'The role of the Board member', 'Monitoring performance', and 'Equality and diversity'. However, development activities are not necessarily evaluated (Cornforth 2001, cited in Ward and Preece 2012).

Elsewhere, in the context of health and safety committees, evidence of the impact of training was limited to perceptions and anecdote (Yassi 2013, citing Eaton and Nocerino 2000; and Milgate et al. 2002). Similarly, induction, training and mentoring was also valued to support public members of research committees (Oliver et al. 2004).

Box 8: Key conclusions about the impact of training

- For public and voluntary sector boards, there was greater emphasis on initial selection and recruitment of board members than on training and development.
- Development activities for members of decision-making groups are often ad hoc and informal despite recognition of their importance for effective group functioning and individual skill building.
- There were examples of good practice around training and development including a 'Non-Executive Director Award' scheme which incorporates coaches, succession planning, external facilitators or consultants with a Human Resources background for support and developmental roles and performance appraisals of Board members.
- A UK university-organisation partnership was also identified that provided training for Board membership incorporating modules such as: 'The role of the Board member', 'Monitoring performance', and 'Equality and diversity'.

Results: Frameworks, Models and Theories

We found ten studies that developed frameworks, models or theories for understanding or assessing the performance of committees.

A systematic review of corporate board evaluations revealed indicators for assessing performance across five process domains (Sajadi et al. 2013). The first domain was the members themselves: what they brought to the role, their understanding of, commitment to and participation in that role; and their relevant external relationships. Other domains were: leadership strength and style; structure; processes (meetings, selection and appointment, education, evaluation); and board dynamics and relationships. These domains accord with much of the evidence presented in this review. However, more can be learnt from papers synthesised theoretically literatures about board performance (Brown 2005; Minichilli et al. 2009) and/or group decision making (Forbes and Milliken 1999; Vandewaerde et al. 2010; Brodbeck et al. 2007) to explore the interactions between the domains.

Forbes and Milliken (1999) integrated the literature about boards of directors with the literature about group dynamics and workgroup effectiveness to develop a theoretical model of effectiveness and efficiency. This model offered two criteria for board effectiveness: the ability of the board to perform its tasks effectively; and the board's ability to continue working together. In this model, cognitive conflict and board

cohesiveness are negatively related, and board task performance is reduced by too little or too much cohesiveness. Thus the greater diversity of members' occupational and educational background increases the knowledge and skills available and cognitive conflict, but simultaneously reduces the board's cohesiveness and use of its knowledge and skills.

Brown (2005) reviewed six dimensions of effective board performance suggested by Chait, Holland, and Taylor (1991), and tested these with a survey of non-profit organisations. Higher performing organisations were reported having high-performing boards across all dimensions. However, it was the interpersonal dimension in particular (creating a sense of inclusiveness, setting goals for themselves, and grooming members for leadership) that provided a unique explanation of judgments of organisational performance.

Minichilli et al. (2009) drew on a broad literature to develop a theoretical model and tested it with a subsequent survey of CEOs of the 2000 largest industrial companies in Italy found that board members' commitment, in particular, and cognitive conflicts and critical debate were far more important for predicting board task performance than was board demographics.

The organisational and social psychology literature reviewed by Brodbeck et al. (2007) supported a model whereby discussion either focuses on prior preferences, with more negotiation than knowledge sharing and individuals evaluating their own knowledge highly (particularly if time is short); or discussion focuses on sharing knowledge, with time and good facilitation encouraging repetition and opportunities for validation of shared knowledge, to achieve mutual learning and better decisions. Much of the literature reviewed above (which does not overlap with the literature used to develop the model) provides supporting empirical evidence.

7. Discussion

Existing systematic reviews have generated the following evidence regarding committee behaviours and processes.

7.1 Summary of findings

Composition and size of decision-making groups: There is little generalisable evidence for how the characteristics of participants and groups influence the judgements produced in formal consensus development methods. However, multi-specialty groups tend to be recommended over single specialty groups in order to take account of a wider range of opinion. Similarly, larger groups offer opportunities for more diverse membership which, when managed well, lead to better performance. They also offer more reliable judgements but may be more difficult to manage and encourage equal participation. Below about six participants, reliability will decline quite rapidly, with improvements in reliability subject to diminishing returns with more than 10-12 participants. Larger groups allow the membership to reflect a broader range of key characteristics and opinions of the population of experts from which the participants are drawn. This may also enhance credibility and widespread acceptance of the final guidelines. They also allow more varied membership which leads to better performance (more perspectives and considerations of alternatives), particularly for non-routine tasks, although conflict may arise between diverse participants. The difference in performance and acceptance of including experts in a committee versus them inputting via consultation has not been explored.

Members are more likely to advocate familiar options (which may come with a financial interest, although the evidence for this is drawn largely from recommendations made outside committees). These initial opinions may affect the group process. For instance, initial consensus may be followed by a shift to a more extreme decision. Alternatively, following an initial split view, members will either move towards one another's views or cohesive subgroups may form to polarise views. Groups with similar compositions are likely to reach similar conclusions.

Environmental factors: There is a lack of evidence about the impact of environmental factors (such as room layout, décor, acoustics, lighting, heating, air conditioning, spatial capacity) on group decision-making but reviews suggested that groups valued good working conditions.

Competencies of effective chairs: There is little rigorous evidence about what specific competences make an effective chair, although corporate board leaders are seen to have a crucial role in establishing inclusive working procedures and an atmosphere of openness, dialogue and trust. Facilitators can help groups to generate more ideas through encouraging members to express diverse opinions and by delaying expressing their own opinion.

Timing of committee work: In 'laboratory studies', where prior knowledge was manipulated, groups often focused their discussions on information that all members know at the outset, although this was less so when they had to choose among a small number of decision alternatives and were pressed for time.

Effective processes and structures for supporting group decision making: In general, the formal consensus methods tested perform better than informal techniques but the

reasons are not clear. Some aspects that are likely to be important include: ensuring that all members have a chance to voice their views; ensuring that all options are discussed; providing feedback and repeating the judgement; and ensuring that individual judgements are made confidentially. It is likely that a good facilitator who can ensure that the procedure is conducted properly will enhance consensus development but there is no rigorous evidence to support this. Providing guideline groups with the review literature results in decisions that are closer to the available research evidence. Effective group processes that need to be supported include: challenging assertions, managing constructive conflict, teamwork, common sharing of goals, active engagement and openness. Conflicts of interest should be ascertained and the appointment of group members should be based on objective and explicit criteria.

Use of media for committee interaction and decision making: Although formal processes are better than informal processes, there is no evidence to suggest there are any major differences in the outcomes achieved between the effectiveness of the Delphi method (used with geographically dispersed groups) and Nominal Group Technique (for face to face meetings); rather, they may be more or less suitable for different purposes and circumstances. For example, the former may prevent undue influence by individuals, and the latter may provide better opportunities for discussion.

Issues of equity: The commercial and public sectors encourage diversity in boards but there is little evidence that it improves performance. At consensus conferences, participation is uneven and related to status and expertise, so that people have participated: actively and continuously; intermittently; or little. In smaller groups, members with higher status/expertise/initial position often exert more influence over the group. If members' status is equal or similar, majority opinion influences the outcome of decisions that require judgement. Otherwise, higher status members sometimes have greater influence over judgements. For intellectual group tasks whoever finds the correct answer tends to have most influence regardless of their status. In non-inclusive cultures, the influence of women on corporate boards was limited unless they make alliances with the most influential members; women tended to have more influence when they were well prepared and employed challenging questions as their main contribution.

Impact of training: Public and voluntary sector boards place greater emphasis on initial selection and recruitment of board members than on training and development. Development activities for members of decision-making groups are often *ad hoc* and informal despite recognition (but no evidence) of their importance for effective group functioning and individual skill building. There were examples of good practice around training and development which incorporates coaching, succession planning, support, development and performance appraisals.

Committee decision-making theory: Empirical evidence supports theoretical models to advance our understanding and assessment of how committees work effectively and efficiently, or otherwise. This understanding is described briefly here and illustrated in Figure 3.

Committee performance depends upon the individuals involved (see top boxes of Figure 3), their attributes and relationships, specifically, members who: are aware of their tasks, roles and responsibilities; understand the wider the context and culture; bring analytical and political competence, interest and willingness; offer time and commitment; actively participate; and behave appropriately over external relationships, confidentially and conflicts of interest.

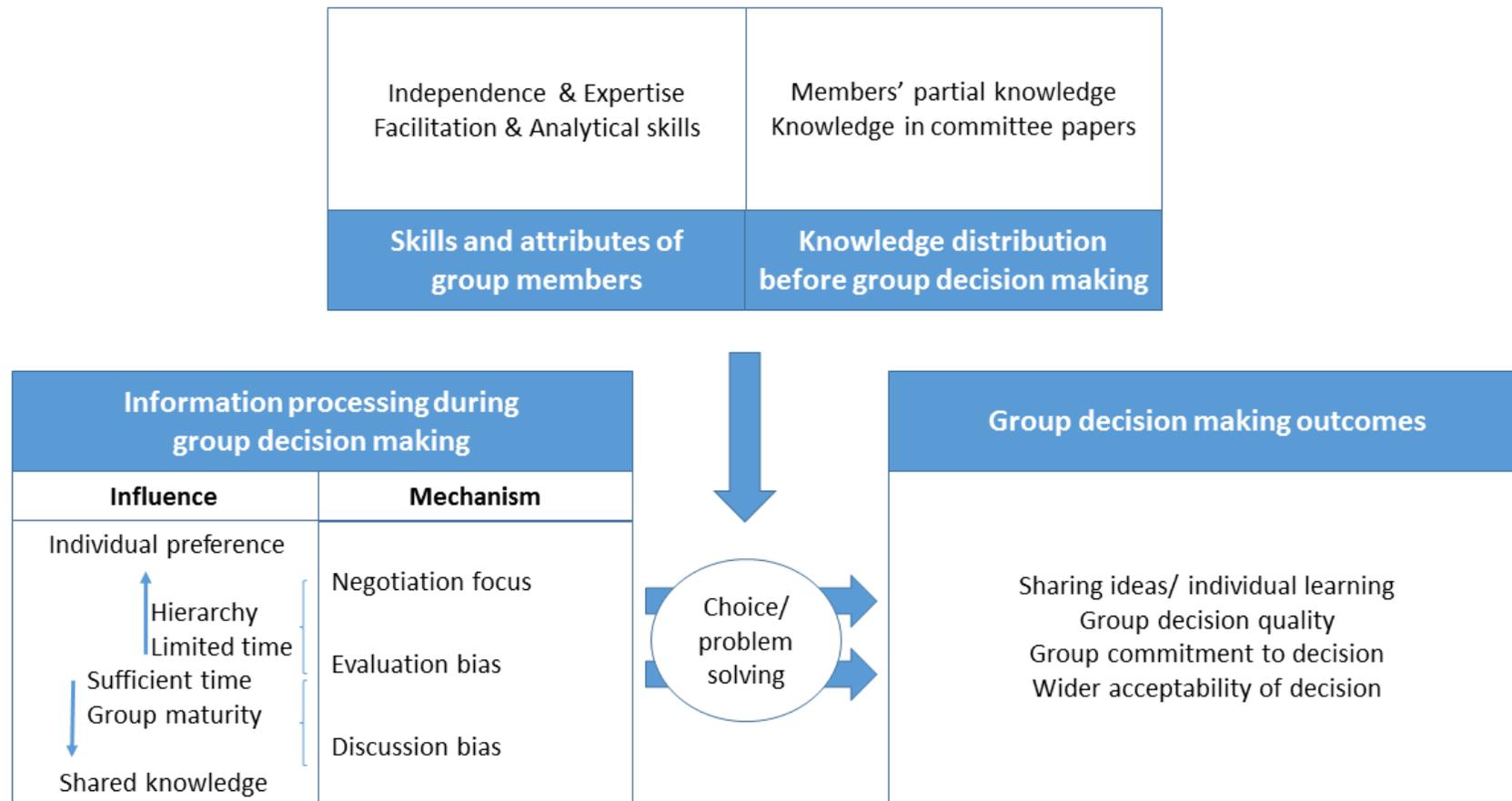
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An important resource is the knowledge brought by individual members, which is unevenly distributed, or presented to them in committee papers or presentations. Demographic diversity has been seen as valuable in bringing different perspectives and a wider variety of alternatives for consideration. Educational and functional diversity has given teams greater strategic clarity.

In addition to the knowledge and skills is the time available for a committee to explore that knowledge to make choices or solve problems. Time for information processing during decision-making (left hand boxes, Figure 3) allows more sharing of knowledge; the more knowledge is shared during discussion, the more it is subject to evaluation by group members. When time is limited, less knowledge is shared and decisions are more the result of negotiating between prior preferences, rather than evaluation of shared knowledge. When tasks involve judgements (rather than intellectual problem solving) , status within the group influences decisions.

With more time, greater facilitation skills to maximise sharing of knowledge, and greater mutual trust developed as committees mature and members get to know each other, more information about all options is revealed and available for evaluation. The result is more sharing of ideas and individual learning, better quality decisions, more commitment to decisions by group members and wider acceptability of decisions within the group's wider networks (right hand boxes of Figure 3).

Figure 3: A model for effective and efficient committees (adapted from Brodbeck et al. (2007) with additional findings of the reviewed literature)



7.2 Strengths and weaknesses of the study

An early strength of this study was the iterative nature of its searching that revealed relevant bodies of literature addressing different contexts applying different academic disciplines. The scope and diversity of the literature, and the speed of the work, mean that we cannot claim to have identified all relevant studies. This limitation is counteracted by our reliance on systematic reviews and theoretical syntheses which allowed the work to be completed quickly while drawing on extensive literatures.

Evidence of ‘what works’ was drawn from systematic reviews of empirical studies of guideline development and business administration committees. Their findings were confirmed and explained by theoretical syntheses drawing on different sets of studies.

7.3 Social and technical processes in the wider literature

This rapid systematic review found that evaluations of health boards have emphasised the individuals involved, their attributes and relationships, specifically, members who: are aware of their tasks, roles and responsibilities; understand the wider context and culture; bring analytical and political competence, interest and willingness; offer time and commitment; actively participate; behave appropriately over external relationships, confidentiality and conflicts of interest (Sajadi et al. 2013). This is very different from how guideline development groups have been evaluated using the AGREE II instrument which emphasises the knowledge explicitly underpinning decisions, criteria for its selection, how it is found, its strengths and limitations, and consideration of the ultimate implications of acting on this knowledge (Brouwers et al. 2010). Although AGREE II notes the composition of the group, it asks little about group interactions.

A similar split has been observed in the overlapping literature about advice taking and decision-making, where an extensive but unsystematic review (Bonaccio and Dalal 2006) found that research has only recently begun to address the social context of decision-making. Again, in the area of patient panels for shaping research (Uhm et al. 2012): some guidance rests on knowledge formalised by organisations or research methods (World Health Organisation 2008; Wright et al. 2010); some comes from the tacit knowledge of people with first-hand experience of collective decision making (Cartwright and Crowe 2011; Hanley et al. 2003; Telford et al. 2004); and some draws on both these types of knowledge (Cowan and Oliver 2011; de Wit et al. 2011). It is the under-researched social elements of effective and efficient committees that were emphasised by the stakeholders consulted for this review.

Hopthrow et al. (2011) considered Brodbeck et al.’s (2007) theories of information sharing and systematic processing applicable to the decision-making of guideline development groups, especially when organisational culture encourages critical ‘norms that create an open, constructive atmosphere enabling members to feel comfortable in airing their views’ (Hopthrow et al. 2011, citing Jehn 1995). However, they wondered whether the relatively large size of a group may hinder the processes. They also noted the significance of group development and cited Whelan’s (2005) stages of group development: 1) group members looking to the leader for direction; 2) the group develops norms, operating procedures and goals (a stage characterised by increased conflict); 3) increased trust and freedom to disagree and a consolidation of relationships; and 4) high productivity and effectiveness. The time for a group to develop, socialise and negotiate norms was seen as relevant by a critical, but unsystematic, review of the guideline development literature, combined with practical experience (Pagliari et al. 2001). Confirmation came from a qualitative study of guideline development groups which found members valued

opportunities to develop as a group, through the forming, storming, norming and performing stages described by Tuckman (Atkins 2013).

7.4 Implications for practice

The findings of this review have a number of implications for the organisation and management of committees.

Committee composition and size: Having members representing the full range of stakeholders could bring the full range of relevant knowledge to discussions, although increasing the size of a committee above 12 members has diminishing returns.

Competencies of effective chairs: Given that members' views tend to favour their own specialist areas, and that good decisions arise from constructive conflict, effective chairs are more likely to be generalists with good facilitation skills to help members share their knowledge; manage hierarchy and conflict constructively; and develop an atmosphere of inclusiveness, openness and trust. Particular effort should be made to reveal knowledge initially held by individual, rather than all, members especially if their status is not high.

Timing of committee work: Time is required to allow knowledge brought to the meeting to be shared and evaluated before decisions are made.

Effective processes and structures for supporting group decision making: Formal consensus methods are recommended, with guideline groups given the relevant technical literature to inform their decisions.

Use of media for committee interaction and decision making: Distance working reduces the influence of individuals, but also opportunities for discussion. Computer-mediated communication (email and chat) may take longer and reduce member satisfaction. However, review level evidence was not available for recent advances in ICT.

Equity issues: Demographic diversity is valued for bringing different perspectives and a wider variety of alternatives for consideration. Educational and functional diversity has given teams greater strategic clarity. More time and effort may be required to explore issues requiring judgements where committee members vary in status.

7.5 Implications for research

This review identified a number of gaps in the evidence on committee effectiveness and efficiency, as follows:

Communication media: Making greater use of electronic communication to improve efficiency by using less resource for convening face-to-face meetings was not well supported by early review level evidence on computer-mediated interaction, which did not include videoconferencing or teleconferencing, so more recent studies need synthesising.

Physical environment: Primary studies have not addressed the impact of environmental factors (e.g. layout, décor, acoustics, lighting, heating, air conditioning, spatial capacity) on committee performance.

Effective processes and structures for supporting group decision making: Development activities are seen as important for effective group functioning but are poorly evaluated.

Future monitoring or evaluation specifically of decision-making processes should consider the quality of group decisions in terms of: the degree of consensus within the group; the attitude of the group towards the processes and the decisions; and the implications of

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decisions in terms of organisational performance (governance, effective and efficient service, public confidence).

Training: More evidence is required about the training of committee members.

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Appendices

Appendix 1: Pilot searches of databases conducted August 2014

IngentaConnect (in title/abstract, note you cannot specify date range so the hits included articles pre 1996)

- Decision AND consensus AND Committee OR panel OR board OR group (433 hits)
- Decision making AND Committee OR panel OR board OR group And Process*(2247 hits)
- Committee OR panel OR board OR group AND size AND effective OR optimal (10577 hits)
- Committee OR panel OR board OR group AND effective AND structure (14193 hits)
- Committee OR panel OR board OR group AND chair* AND effective (363 hits)
- Committee OR panel OR board OR group AND moderator AND effective (5449 hits)
- Committee OR panel OR board OR group AND facilitator AND effective (3258 hits)
- Committee OR panel OR board OR group AND effective AND lighting (3972 hits)
- Committee OR panel OR board OR group AND effective AND environment (5187 hits)
- Committee OR panel OR board OR group AND effective AND layout (74 hits)
- Committee OR panel OR board OR group AND effective AND acoustics (398 hits)
- Committee OR panel OR board OR group AND size AND decision* (149 hits)
- Meeting AND decision* AND length OR timing (816 hits)
- Group AND decision*AND video OR email OR web OR media OR virtual (2798 hits)
- Chair* AND meeting AND decision (33 hits)

JSTOR (in abstract, 1996-2014, English language)

- Decision AND consensus AND Committee OR panel OR board OR group (17 hits)
- Decision making AND Committee OR panel OR board OR group And Process*(18 hits)
- Committee OR panel OR board OR group AND size AND effective OR optimal (208 hits)
- Committee OR panel OR board OR group AND effective AND structure (262 hits)
- Committee OR panel OR board OR group AND chair* AND effective (0 hits)
- Committee OR panel OR board OR group AND moderator AND effective (7 hits)
- Committee OR panel OR board OR group AND facilitator AND effective (19 hits)
- Committee OR panel OR board OR group AND effective AND lighting (0 hits)
- Committee OR panel OR board OR group AND effective AND environment (182 hits)
- Committee OR panel OR board OR group AND effective AND layout (2 hits)
- Committee OR panel OR board OR group AND effective AND acoustics (398 hits)
- Committee OR panel OR board OR group AND size AND decision* (7 hits)
- Meeting AND decision* AND length OR timing (2 hits)
- Group AND decision* AND video OR email OR web OR media OR virtual (16 hits)
- Chair* AND meeting AND decision (9 hits)

GoogleScholar

- Decision AND consensus AND Committee OR panel OR board OR group (“about 2,040,000 results”)

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- Decision making AND Committee OR panel OR board OR group And Process* (“about 1,430,000 results”)
- Committee OR panel OR board OR group AND size AND effective OR optimal (“about 4,380,000 results”)
- Committee OR panel OR board OR group AND effective AND structure (“about 4,280,000 results”)
- Committee OR panel OR board OR group AND chair* AND effective (“about 1,260,000 results”)
- Committee OR panel OR board OR group AND moderator AND effective (“about 181,000 results”)
- Committee OR panel OR board OR group AND facilitator AND effective (“about 179,000 results”)
- Committee OR panel OR board OR group AND effective AND lighting (“about 1,220,000 results”)
- Committee OR panel OR board OR group AND effective AND environment (“about 3,850,000 results”)
- Committee OR panel OR board OR group AND effective AND layout (“about 818,000 results”)
- Committee OR panel OR board OR group AND effective AND acoustics (“about 210,000 results”)
- Committee OR panel OR board OR group AND size AND decision* (“about 1,890,000 results”)
- Meeting AND decision* AND length OR timing (“about 2,370,000 results”)
- Group AND decision* AND video OR email OR web OR media OR virtual (“about 1,870,000 results”)
- Chair* AND meeting AND decision (“about 414,000 results”)

PsychInfo (abstract, 1996-2014)

- Decision AND consensus AND Committee OR panel OR board OR group (10 hits)
- Decision making AND Committee OR panel OR board OR group And Process*(63 hits)
- Committee OR panel OR board OR group AND size AND effective OR optimal (24 hits)
- Committee OR panel OR board OR group AND effective AND structure (12 hits)
- Committee OR panel OR board OR group AND chair* AND effective (1 hit)
- Committee OR panel OR board OR group AND moderator AND effective (8 hits)
- Committee OR panel OR board OR group AND facilitator AND effective (4 hits)
- Committee OR panel OR board OR group AND effective AND lighting (1 hits)
- Committee OR panel OR board OR group AND effective AND environment (15 hits)
- Committee OR panel OR board OR group AND effective AND layout (0 hits)
- Committee OR panel OR board OR group AND effective AND acoustics (0 hits)
- Committee OR panel OR board OR group AND size AND decision* (8 hits)
- Meeting AND decision* AND length OR timing (1 hit)
- Group AND decision* AND (video OR email OR web OR media OR virtual) (6 hits)
- Chair* AND meeting AND decision (2 hits)

Appendix 2: Final electronic searches conducted August 2014

Searches of The Cochrane Library

Searched using combinations of free text terms and specific MeSH terms identified from the indexing of Murphy et al. (1998) relevant from list of MESH terms in MEDLINE/Pubmed database

Specified date range of 01/01/2006-present day, published.

All searches that returned any hits have been saved, converted to an RIS file and uploaded onto EPPI-Reviewer. The search files have been saved/named according to the search number in this document e.g. 'Pubmed result 3 RIS export' contains the results of Search 3) below. Search 4) and Search 6) returned no hits so there is no corresponding RIS file in EPPI-Reviewer.

Search 1) "Consensus development conference"

Search 2) "guideline development" AND advisory

Search 3) "Delphi technique" AND advisory

Search 4) "Advisory committee" AND "consensus development"

Search 5) Decision AND consensus AND committee

Search 6) "Decision support techniques" AND advisory

Search 7) Chairperson AND decision AND meeting

Search 8) "Decision making, organisational"

Search 9) Decision AND consensus AND advisory

Search 10) Group AND "decision making" AND (virtual OR video OR media OR web)

Search 11) Chairing AND meeting AND decision

Search 12) Meeting AND decision AND (length OR timing)

Search 13) Advisory AND decision AND size. (NOTE that I also re-ran the search substituting 'decision' for 'decision making' to see if any different results came up but the same article was returned)

Search 14) Advisory AND effective AND (lighting OR environment OR Layout OR acoustics)

Search 15) (Committee OR panel) AND decision AND size

Search 16) (Committee OR panel) AND (chair OR chairperson OR facilitator) AND effective

Search 17) Advisory AND (chair OR chairperson OR facilitator) AND effective

Search 18) (Advisory OR committee OR panel) and effective AND structure

Search 19) (Advisory OR committee OR panel) and effective AND process

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Some additional MeSH terms were identified as potentially relevant through scanning the list of MeSH terms so searches were run on these too:

- Search 20) Clinical AND guidelines AND committee
- Search 21) Clinical AND guideline AND development
- Search 22) Clinical guidelines panel
- Search 23) Clinical guideline development committee
- Search 24) Clinical guideline development process
- Search 25) Advisory board members
- Search 26) Advisory group members
- Search 27) Advisory committee meeting
- Search 28) Guideline development committee
- Search 29) Guideline development group members
- Search 30) Advisory committee meetings

Searches of PubMed

Searched using combinations of terms set out in protocol and also searched specific MeSH terms identified from the indexing of Murphy report and deemed relevant from list of MESH terms in MEDLINE/Pubmed database

Specified date range of 01/01/2006-present day and English language only

- Search 1) “Consensus development conference”
- Search 2) “guideline development” AND advisory
- Search 3) “Delphi technique” AND advisory
- Search 4) “Advisory committee” AND “consensus development”
- Search 5) Decision AND consensus AND committee
- Search 6) “Decision support techniques” AND advisory
- Search 7) Chairperson AND decision AND meeting
- Search 8) “Decision making, organisational”
- Search 9) Decision AND consensus AND advisory
- Search 10) Group AND “decision making” AND (virtual OR video OR media OR web)
- Search 11) Chairing AND meeting AND decision
- Search 12) Meeting AND decision AND (length OR timing)

Search 13) Advisory AND decision AND size (NOTE that I also re-ran the search substituting 'decision' for 'decision making' to see if any different results came up but the same articles were returned)

Search 14) Advisory AND effective AND (lighting OR environment OR Layout OR acoustics)

Search 15) (Committee OR panel) AND decision AND size

Search 16) (Committee OR panel) AND (chair OR chairperson OR facilitator) AND effective

Search 17) Advisory AND (chair OR chairperson OR facilitator) AND effective

Search 18) (Advisory OR committee OR panel) and effective AND decision AND structure

Search 19) (Advisory OR committee OR panel) and effective AND decision AND process

Some additional MeSH terms were identified as potentially relevant through scanning the list of MeSH terms so searches were ran on these too:

Search 20) Clinical guidelines committee

Search 21) Clinical guideline development

Search 22) Clinical guidelines panel

Search 23) Clinical guideline development committee

Search 24) Clinical guideline development process

Search 25) Advisory board members

Search 26) Advisory group members

Search 27) Advisory committee meeting

Search 28) Guideline development committee

Search 29) Guideline development group members

Search 30) Advisory committee meetings

Searches of DARE

Specified date range of 2006-2014. No abstract option available, only title so searches were carried out under the 'Any field' option to ensure wide capture of results. Note that quotation marks around terms are not required in this database; two or more search terms entered in a single box are automatically searched for as a phrase

Search 1) Consensus development conference

Search 2) guideline development AND advisory

Search 3) Delphi technique AND advisory

Search 4) Advisory committee AND consensus development

Search 5) Decision AND consensus AND committee

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Search 6) Decision support techniques AND advisory

Search 7) Chairperson AND decision AND meeting

Search 8) Decision making AND organisational

Search 9) Decision AND consensus AND advisory

Search 10) Group AND “decision making” AND virtual

Search 11) Group AND “decision making” AND video

Search 12) Group AND “decision making” AND media

Search 13) Group AND “decision making” AND web

Search 14) Chairing AND meeting AND decision

Search 15) Meeting AND decision AND length

Search 16) Meeting AND decision AND timing

Search 17) Advisory AND decision AND size - (NOTE that I also re-ran the search substituting ‘decision’ for ‘decision making’ to see if any different results came up but there were no hits for this combination)

Search 18) Advisory AND effective AND lighting

Search 19) Advisory AND effective AND environment

Search 20) Advisory AND effective AND layout

Search 21) Advisory AND effective AND acoustics

Search 22) Committee AND decision AND size

Search 23) panel AND decision AND size

Search 24) (Committee OR panel) AND (chair OR chairperson OR facilitator) AND effective

Search 25) Advisory AND (chair OR chairperson OR facilitator) AND effective

Search 26) (Advisory OR committee OR panel) and effective AND structure

Search 27) (Advisory OR committee OR panel) and effective AND process

MeSH terms:

Search 28) Clinical guidelines committee

Search 29) Clinical guideline development

Search 30) Clinical guidelines panel

Search 31) Clinical guideline development committee

Search 32) Clinical guideline development process

Search 33) Advisory board members

Search 34) Advisory group members

Search 35) Advisory committee meeting

Search 36) Guideline development committee

Search 37) Guideline development group members

Search 38) Advisory committee meetings

Searches of PROSPERO

Searched using combinations of terms set out in protocol and also searched specific MeSH terms identified from the indexing of Murphy report and deemed relevant from list of MESH terms in MEDLINE/Pubmed database

Specified date range of 01/01/2006-present day, published.

All searches that returned any hits have been saved, converted to an RIS file and uploaded onto EPPI-Reviewer. The search files have been saved/named according to the search number in this document e.g. 'Pubmed result 3 RIS export' contains the results of Search 3) below. Search 4) and Search 6) returned no hits so there is no corresponding RIS file in EPPI-Reviewer.

There is no facility to export from PROSPERO into EPPI reviewer so articles were saved as pdf and imported manually into EPPI-Reviewer

Search 1) "Consensus development conference"

Search 2) "guideline development" AND advisory

Search 3) "Delphi technique" AND advisory

Search 4) "Advisory committee" AND "consensus development"

Search 5) Decision AND consensus AND committee

Search 6) "Decision support techniques" AND advisory

Search 7) Chairperson AND decision AND meeting

Search 8) "Decision making, organisational" (MeSH term suggested by NICE)

Search 9) Decision AND consensus AND advisory

Search 10) Group AND "decision making" AND (virtual OR video OR media OR web)

Search 11) Chairing AND meeting AND decision

Search 12) Meeting AND decision AND (length OR timing)

Search 13) Advisory AND decision AND size. (NOTE that I also re-ran the search substituting 'decision' for 'decision making' to see if any different results came up but the same articles were returned)

Search 14) Advisory AND effective AND (lighting OR environment OR Layout OR acoustics)

Search 15) (Committee OR panel) AND decision AND size

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Search 16) (Committee OR panel) AND (chair OR chairperson OR facilitator) AND effective

Search 17) Advisory AND (chair OR chairperson OR facilitator) AND effective

Search 18) (Advisory OR committee OR panel) and effective AND structure

Search 19) (Advisory OR committee OR panel) and effective AND process

Some additional MeSH terms were identified as potentially relevant through scanning the list of MeSH terms so searches were ran on these too:

Search 20) Clinical AND guidelines AND committee

Search 21) Clinical AND guideline AND development

Search 22) Clinical guidelines panel

Search 23) Clinical guideline development committee

Search 24) Clinical guideline development process

Search 25) Advisory board members

Search 26) Advisory group members

Search 27) Advisory committee meeting

Search 28) Guideline development committee

Search 29) Guideline development group members

Search 30) Advisory committee meetings

Websites as sources of evidence

Association of Chief Executives of Voluntary Organisations: www.acevo.org.uk

Chartered Institute of Professional Development: <https://www.cipd.co.uk>

Confederation of British Industry: <http://www.cbi.org.uk>

Durham University Business School: www.dur.ac.uk/dubs/

Institute of Directors: <http://www.iod.com>

Institute of Leadership and Management: <https://www.i-l-m.com>

International Corporate Governance: <https://www.governance.co.uk/>

London Business School: <http://www.london.edu/>

Manchester Business School: <http://www.mbs.ac.uk/>

Appendix 3: Map of included studies

Each review sub-question is listed here, together with a description of the context and design of the studies addressing each sub-question.

Table 4: Included studies: questions and contexts

	What is meant by 'effective/efficacy'	Size of the committee	Composition of the committee	Characteristics of committee chair	Media for interactions and decisions	Timings of meeting	Structures/ processes for supporting interaction/decisions	Equity and structures/ processes	Physical environment of the committee	Impact of training	Other
Clinical guideline development	15	11	28	9	24	3	39	12	3	1	4
Research Committee	1	0	4	1	1	0	3	1	0	0	2
Psychology	6	4	8	5	6	8	9	6	1	0	6
Business administration	11	13	24	6	0	2	20	6	0	4	1
Group dynamics/ Facilitation practice	6	6	6	3	12	5	11	4	2	0	6
Patient public involvement	1	0	1	0	1	1	1	1	0	1	0
Ergonomics and design	0	0	0	0	0	0	0	0	2	0	0

NB Many studies addressed more than one question

Committee structure and environment:

- *'The optimal composition (e.g. topic generalists or specialists, past committee experience/ skills, demographics - gender, ethnicity, age) and size for decision-making committees, and the advantages and disadvantages of groups of different compositions and sizes (i.e. impact on the outputs and of decision making)?'*

We found 60 studies addressing the **composition of committees**. These come from three different academic disciplines: health (32); business administration (24); and psychology (8). Specific foci include: guideline development (28); other research committees (4); board/ audit committees (24); and group dynamics (6).

Reviews addressing the composition of committees included: systematic reviews (11); systematic reviews of systematic reviews (6); and non-systematic reviews (10).

Primary studies included: experimental design (4); observational studies (12); qualitative studies (10); and theoretical/mathematical models (2).

Table 5: Included studies: questions and study designs

Code	What is meant by 'effective/efficacy'	Size of the committee	Composition of the committee	Characteristics of committee chair	Media for interactions and decisions	Timings of meeting	Structures/ processes for supporting interaction/decisions	Equity and structures/ processes	Physical environment of the committee	Impact of training	Other
Experimental design	4	2	4	0	10	2	10	1	1	0	3
Systematic review	5	5	11	4	8	5	11	5	2	2	3
Systematic review of systematic reviews	2	2	6	3	4	0	11	3	1	0	0
Meta-analysis	0	0	0	0	0	0	0	0	1	0	0
Non-systematic review	6	4	10	5	4	3	9	5	0	0	2
Observational study	3	6	12	1	1	0	8	2	0	2	0
Qualitative methods	3	2	10	4	5	0	13	7	1	2	2
Theoretical/ mathematical model	2	4	2	0	1	0	3	0	0	0	0
Development of a framework/ model	6	3	7	2	1	1	6	1	0	0	1

NB Many studies addressed more than one question

We found 27 studies addressing the **size** of decision making groups. These came from three academic disciplines: health (11); psychology (6); and business administration (13). They specifically addressed: guideline development (11); and group dynamics (6).

Reviews addressing size of committees included: systematic reviews (5); systematic reviews of systematic reviews (2); and non-systematic reviews (4).

Primary studies included: experimental designs (2); observational (6); qualitative (2); and theoretical/ mathematical modelling (4).

The literature about panels and committees overlapped with the literature about patient and public involvement. We found one systematic review of patient and public involvement which considered involvement in committees or panels (Table 4). It addressed the structures and processes for supporting committees, equity, timing and media for interactions, and training (Table 4).

- *The impact of **environmental factors** on committee work (e.g. layout, environment, acoustics, lighting, heating, air conditioning, spatial capacity)*

We found six studies addressing the physical environment. These included studies from health (3); psychology (1); and the built environment (2). They specifically addressed guideline development (3), group dynamics and facilitation (2), and ergonomics (2) (Table 5).

The physical environment was addressed by four reviews: systematic reviews (2); systematic review of systematic reviews (1); meta-analysis (1); and two primary studies (one qualitative and one experimental design).

Evidence addressing the question posed about the impact of the physical environment of the committee proved the most elusive. The search found a large literature about ergonomics and office design. However, these studies generally did not address committee performance. We found one meta-analysis on the impact of environmental conditions on worker performance, and a primary study on the effects of meeting room interior design on team performance in a creativity task. We have retrieved the meta-analysis but not the primary study.

We contacted the author of a primary study that examined the effects of interior design on group creativity, mood and psychological safety (de Korte et al. 2011). She confirmed the findings of our search by writing 'To my knowledge, there is much literature on the effects of the physical environmental factors on individual performance/ health/ wellbeing, but not specifically on group performance/ teams'. At the time of writing, primary research in the area of environmental effects on group creativity is ongoing, but the findings are not yet available.

Chairing:

- *The most effective type of **committee chair** (competencies, skills e.g. topic specialists vs generalist)*

Chairing was addressed in 12 reviews: systematic reviews (4); systematic reviews of systematic reviews (6); and non-systematic reviews (5). The primary studies were observational (1) and qualitative (4). Two studies developed a framework or model.

Because the role of a chair is to facilitate discussion and group decisions it is appropriate here also to consider the complementary literature about **group dynamics and facilitation skills** which probably overlaps with the psychology literature. (Indeed, there were repeated references in the literature to the benefit of chairs having facilitation skills.) Studies we identified from this literature addressed all but one of the questions posed by NICE (Table 4). Most of these studies employed experimental designs (11). There were also two systematic reviews, one observational study, two qualitative studies and one theoretical/ mathematical modelling study (Table 5).

Committee processes:

- The impact of meeting length, number and timing on committee work

We found 11 studies addressing timing issues: three within the context of guideline development; eight from psychology; and five addressing facilitation and group dynamics. These included eight reviews: five systematic, and three non-systematic. The two primary studies had experimental designs.

- *Effective and cost effective processes and structures for supporting committee decision making (for example, consensus techniques, decision support tools)*

Structures or processes for supporting interaction or decision making were studied most extensively in the literature. We found 71 studies of which 39 were specifically about guideline development. Other studies were in the academic disciplines of health (3); business management (20); and psychology (9). Eleven studies specifically addressed facilitation and group dynamics.

Most of these studies were reviews and showed considerable overlap: systematic reviews (11); systematic reviews of systematic reviews (11); and non-systematic reviews (9). Primary studies included: experimental designs (10); observational studies (8); qualitative studies (13); and theoretical/ mathematical modelling (3).

- *How use of different media (e.g. videoconferencing, email) for committee interaction impact on decision making and costs*

The use of different media for interactions and decisions was addressed in 34 studies, between them addressing: guideline development (24) and group dynamics and facilitation (12). Six studies were from psychology. Different media were addressed in eight systematic reviews, four systematic reviews of systematic reviews, and four non-systematic review. Primary studies included experimental designs (10), observational (1), qualitative (5) studies and one mathematical modelling study.

- *Equity considerations associated with different committee structures and processes*

Equity in relation to structures and processes was noted in 23 studies addressing: guideline development (12), research committee (1), psychology (6); business administration (6); group dynamics/ facilitation (4), public involvement (1).

This topic appeared in 13 reviews: five systematic, three systematic reviews of systematic reviews, and five non-systematic reviews. Primary studies had experimental (1), qualitative (7) and observational designs (2).

- *The impact of training on technical and engagement issues for committee chairs, committee members and secretariat.*

Six studies addressed training: four in business administration and one for guideline development. These were systematic reviews (2), qualitative studies (2) and two observational studies.

Appendix 4: Types of decision-making groups active in different sectors

Types of groups	Definition	Source
Audit committee	<p>A selected number of members of a company's board of directors whose responsibilities include helping auditors remain independent of management. Most audit committees are made up of three to five or sometimes as many as seven directors who are not a part of company management.</p> <p>The audit committee plays a critical role in providing oversight and serving as a check and balance on a company's financial reporting system. The committee provides independent review and oversight of a company's financial reporting processes, internal controls and independent auditors. It provides a forum separate from management in which auditors and other interested parties can candidly discuss concerns.</p> <p>By effectively carrying out its functions and responsibilities, the audit committee helps to ensure that management properly develops and adheres to a sound system of internal controls, that procedures are in place to objectively assess management's practices and internal controls, and that the outside auditors, through their own review, objectively assess the company's financial reporting practices.</p>	<p>Financial Times Lexicon: ft.com/lexicon</p>
(Corporate) board/ Board of Directors	<p>The group of people who have been elected to manage a company by those holding shares in the company.</p> <p>A group of people who make important decisions or rules about how an institution operates and make sure that these rules are obeyed.</p>	<p>Financial Times Lexicon: ft.com/lexicon</p>
Board of trustees	<p>Board of directors of a non-profit organisation (NPO) such as a charity, trust, or university. Members of the board are appointed (not elected) to set the policies of the organisation, and appoint (and fire) senior management personnel. Under the doctrine of collective responsibility, the entire board is liable for the financial and other consequences of the organisation's activities.</p>	<p>Businessdictionary.com</p>
(NICE) Guideline Development Group	<p>A group of healthcare and other professionals, patients and carers, and technical staff who develop the recommendations for a clinical guideline. The Guideline Development Group (GDG): contributes to preparing the scope (GDG Chair and Clinical Adviser only); refines and agrees the review questions that will guide the search for evidence; discusses the evidence and draws conclusions; develops the guideline recommendations; responds to comments received during consultation and agrees on necessary changes to the guideline; works with NICE to develop the NICE pathway, Information for the public' and implementation tools (see chapters 10, 12 and 13); and supports and promotes uptake of the guideline</p>	<p>National Institute for Health and Clinical Excellence (2012)</p>

Appendix 5: Table of syntheses reviewed in detail

First author (year)	Substantive literature	Included designs	Search strategy	Type of synthesis	Findings for questions
Hutchings and Raine (2006)	Guideline development	Controlled studies	Systematic	Thematic summary	Committee composition Communication media Structures/ processes
Murphy et al. (1998) Black et al. (1999)	Guideline development Group dynamics/ facilitation Psychology	Any	Systematic	Thematic summary	All except training
Baltes et al. (2002)	Group dynamics/ facilitation Psychology	Comparison groups	Systematic	Statistical meta-analysis	Communication media Timing
McCoy et al. (2012)	Business management	Any	Systematic	Framework development	Committee composition Equity
Knai et al. (2012)	Guideline development	Appraisal of clinical guidelines	Systematic	Thematic summaries	Committee composition Communication media
Lundh et al. (2013)	Drug, device or medical imaging products	Any	Systematic	Statistical meta-analysis	Structures/ processes (authors' recommendations)

Appendix 5: Table of syntheses reviewed in detail

First author (year)	Substantive literature	Included designs	Search strategy	Type of synthesis	Findings for questions
Boulkedid et al. (2011)	Guideline development	Evaluation	Systematic	Descriptive statistics	Committee size Committee composition Communication media Structures/ processes
Reimer et al. (2010)	Psychology	Comparison groups	Systematic	Statistical meta-analysis	Timing Structures/ processes
Yassi et al. (2010)	Business management (workplace safety)	Empirical data	Systematic	Realist review	Committee size Committee composition Timing Structures/ processes Training
Kotter et al. (2013)	Research committee (patient and public involvement)	Any	Systematic	Thematic summaries	Committee composition Communication media
Jonsdottir (2010)	Business management	Any	Systematic	Thematic summaries	Committee composition Committee chair Structure/ processes Equity

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First author (year)	Substantive literature	Included designs	Search strategy	Type of synthesis	Findings for questions
Ramsay et al. (2010)	Business management (health boards)	Any	Systematic	Thematic summaries	Committee size Committee composition Committee chair Structures/ processes Equity
Ward and Preece (2012)	Business management (housing)	Any	Systematic	Thematic summaries	Training
Oliver et al. (2004)	Patient and public involvement	Any	Systematic	Framework synthesis	Communication media Timing Structures/ processes Equity
Sajadi et al. (2013)	Business management (health boards)	Any	Systematic	Thematic summaries Developing a framework	Committee composition Committee chair Structures/ processes
Fretheim et al. (2006) #3	Guideline development	Systematic reviews	Systematic	Thematic summaries	Committee size Committee composition Committee chair Structures/ processes Equity

Appendix 5: Table of syntheses reviewed in detail

First author (year)	Substantive literature	Included designs	Search strategy	Type of synthesis	Findings for questions
Fretheim et al. (2006) #5	Guideline development	Systematic reviews	Systematic	Thematic summaries	Committee chair Communication medium Structures/ processes Physical environment
Oxman et al. (2006) #16	Guideline development	Systematic reviews	Systematic	Thematic summaries	Structures/ processes
Oxman et al. (2006) #7	Guideline development	Systematic reviews	Systematic	Thematic summaries	Structures/ processes
Schunemann et al. (2006) #6	Guideline development	Systematic reviews	Systematic	Thematic summaries	Committee composition Structures/ processes
Kunz et al. (2012)	Guideline development	Systematic reviews	Systematic	Thematic summaries	Committee size Committee composition Committee chair Communication medium Structures/ processes Equity
Tan-Torres Edejer (2006) #11	Guideline development	Systematic reviews	Systematic	Thematic summaries	Committee composition Structures/ processes
Schünemann et al. (2006) #10	Guideline development	Systematic reviews	Systematic	Thematic summaries	Committee composition Communication medium Structures/ processes

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First author (year)	Substantive literature	Included designs	Search strategy	Type of synthesis	Findings for questions
Kelson et al. (2012)	Guideline development	Systematic reviews	Systematic	Thematic summaries	Committee composition Equity
Oxman et al. (2006) #2	Guideline development	Systematic reviews	Systematic	Thematic summaries	Communication medium Structures/ processes
Boyd and Bero (2006) #4	Guideline development	Systematic reviews	Systematic	Thematic summaries	Structures/ processes
Mohiuddin and Karbhari (2010)	Business management	Unspecified	Unspecified	Developing a model	Committee size
DeZoort et al. (2002)	Business management	Unspecified	Unspecified	Developing a model	Committee composition Structures/ processes
Minichilli et al. (2009)	Business management	Unspecified	Unspecified	Developing a model	Committee size Committee composition
Forbes and Millikan (1999)	Business management Group dynamics	Unspecified	Unspecified	Developing a model	Committee composition Structures/ processes
Brown (2005)	Business management	Unspecified	Unspecified	Developing a model	Committee size Committee composition Timing Structures/ processes
Vandewaerde et al. (2010)	Business management	Unspecified	Unspecified	Developing a model	Committee chair

Appendix 5: Table of syntheses reviewed in detail

First author (year)	Substantive literature	Included designs	Search strategy	Type of synthesis	Findings for questions
Brodbeck et al. (2007)	Social and organisational psychology	Unspecified	Unspecified	Developing a model	Structures/ processes
Oseland and Burton (2012)	Ergonomics and design	Experimental design	Limited systematic search	Statistical meta-analysis	Physical environment

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