

# Consensus Methods: Characteristics and Guidelines for Use

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**Abstract:** Consensus methods are being used increasingly to solve problems in medicine and health. Their main purpose is to define levels of agreement on controversial subjects. Advocates suggest that, when properly employed, consensus strategies can create structured environments in which experts are given the best available information, allowing their solutions to problems to be more justifiable and credible than otherwise. This paper surveys the characteristics of several major methods (Delphi, Nominal Group,

and models developed by the National Institutes of Health and Glaser) and provides guidelines for those who want to use the techniques. Among the concerns these guidelines address are selecting problems, choosing members for consensus panels, specifying acceptable levels of agreement, properly using empirical data, obtaining professional and political support, and disseminating results. (*Am J Public Health* 1984; 979-983.)

## Introduction

Formal consensus methods have become increasingly visible as tools for solving problems in health and medicine. Their main purpose is to define levels of agreement on controversial subjects, and they have been used in a wide variety of settings. Since 1977, for example, the National Institutes of Health has organized over 40 consensus development conferences to help resolve issues related to knowledge and use of medical technologies, such as intraocular lens implantation, coronary artery bypass surgery, and the treatment of breast cancer. The Centers for Disease Control has used a Delphi technique and decision analysis to select preventive treatment for isoniazid-resistant tuberculous infection. Many Professional Standards Review Organizations (PSROs) have relied on consensus methods to help choose among the many areas of medicine that might be justifiable subjects for evaluation and to set standards of quality. The Clinical Efficacy Assessment Project of the American College of Physicians uses consensus to generate state-of-the-art opinions on important practice issues in internal medicine. Finally, at the University of California, Los Angeles (UCLA) and the Rand Corporation (Santa Monica, California), researchers are holding consensus panels for a national study to determine the indications for selected medical and surgical procedures so that the appropriateness of their use can be ascertained.

But to what extent is the support of consensus warranted? Are the results of consensus valid? Are they used? At present, the data to answer these questions have by no means been easy to rely on. Some studies of the reliability, validity, and impact of consensus are available, but the findings are mixed.<sup>1-3</sup> At the Rand Corporation, investigators are attempting to resolve some of the issues by studying the NIH Consensus Development Program, one of the largest efforts yet undertaken to use consensus techniques. Among the study's concerns are how and to what extent the

consensus statements issued by NIH are disseminated and if changes in physician behavior can be associated with them.<sup>4</sup>

In the absence of a clear defense of the merits of consensus methods, their weaknesses are thought by some to outweigh their strengths. Rennie,<sup>5</sup> for example, in talking about the NIH consensus statements about coronary artery bypass surgery, points out:

"As I read such statements, I have the sensation that I am being provided the bland generalities that represent the lowest common denominator of a debate—the only points on which the experts can wholeheartedly agree—and that these points must be so mild, so far from the cutting edge of progress, and so well-established that surely everybody must already know them. . . . moreover, . . . the statements may be taken to embalm a set of truths—an idea that the scientists who developed these statements would be horrified to consider. This spurious stamp of approval would be very hard for the individual physician to resist, and it might have legal as well as other practical implications."<sup>5</sup>

At present, the supporters of consensus appear to be the more vociferous, and the use of consensus appears to be increasing. Despite that acceptance, literature is not generally available on the characteristics of the processes that are in current use, their advantages and limitations, and how they might be structured so that, at least on the face of it, the results will be credible. The purpose of this paper is to help make up for that lack.

## Consensus Methods

The Delphi and nominal group consensus methods have a relatively long history of use in health and medicine. Both have formal rules for collecting and analyzing information and place their emphasis on the production of immediate solutions to problems. Recently, the National Institutes of Health and Dr. Edward Glaser have developed new methods. Like Delphi and nominal group, these methods also provide participants with a structured environment for problem solving. They are somewhat different, however, in their concern with getting the results publicized in order to educate practitioners and, ultimately, to change medical care. Also, unlike Delphi and nominal group, the newer methods have not yet been standardized, nor have they demonstrated the problems to which they are most suited.

### Delphi

The Delphi method, which originated in 1948, is an attempt to obtain expert opinion in a systematic manner.<sup>6-8</sup>

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Experts who participate in a Delphi are polled individually and anonymously, usually with self-administered questionnaires. The survey is conducted over three or four "rounds," but after each one, the results are elicited, tabulated, and then reported to the group. A Delphi is considered complete when there is a convergence of opinion or when a point of diminishing returns is reached.

Delphi has the advantage of enabling each participant to express views impersonally, while ultimately providing information generated by an entire group. Also, since Delphi questionnaires are often completed by mail, no geographical constraints on the selection of experts need be imposed. The process is relatively easy to understand, it is flexible in the sense that the number of rounds can be adjusted to meet an investigator's needs, and it can be applied to a broad range of topics such as population growth, automation, prevention of war, and weapon systems.<sup>9</sup> In more recent years, Delphi strategies have been used to solve an array of problems in health and medicine that have ranged from the needs of an individual hospital or department to those of a statewide agency or state.<sup>10-20</sup>

Despite its usefulness, Delphi has some notable limitations. For example, its reliability increases with the size of the group and the number of rounds, but panelists sometimes become fatigued after two or three rounds,<sup>21</sup> and coordinating large groups and several rounds can be complicated and costly. Also, if personal contact among participants is desirable, then Delphi is not appropriate.

Sackman, in his critical analysis of conventional Delphi, concluded that its liabilities outweighed its assets, often being characterized by crude questionnaire design, vulnerability with respect to who is an "expert," and obliviousness to reliability measurement and scientific validation of findings.<sup>22</sup>

#### Nominal Group

The nominal group process is a structured meeting that attempts to provide an orderly procedure for obtaining qualitative information from target groups who are most closely associated with a problem area.<sup>23,24</sup>

The first step in the nominal group process is to assemble all participants and ask them to list, individually and without discussion, their own ideas on a specific topic or question. At the completion of a given period of time, each individual, in round-robin fashion, presents the most important idea on his or her list. The process is repeated until all lists are exhausted. The ideas are recorded on a chart so that everyone present can see the composite list.

In the next phase, a highly structured discussion of the ideas on the composite list occurs. Participants evaluate each idea separately and, when necessary, clarify the ideas. After the discussion, each participant, privately and in writing, ranks or rates the idea's worth; next, the group's views are assessed.

Since the late 1960s, nominal group has been applied to problems in social service, education, government organizations, and industry. For example, it has been used in a research project to develop consumer and professional definitions of the roles and qualities of primary health care organizations<sup>25</sup>; to measure tasks delegation among differing nursing skill levels<sup>26</sup>; and, in a modified form, to elicit team judgment in the selection of quality assurance topics.<sup>27</sup> The success of nominal group depends on the skills of a highly trained leader, and on the willingness of a group of about eight to ten people to work together in a highly structured

setting. Horn and Williamson<sup>1</sup> used nominal group procedures to identify topics for quality assurance reviews in a medical facility. Relying on statistical methods, they concluded that the procedures were highly reliable and produced valid topics in 17 of 18 cases. Thornell, however, found that a nominal group process produced less frequent and stable consensus on the management of emergency medical cases than did Delphi.<sup>2</sup>

#### NIH Consensus Development

The National Institutes of Health (NIH) includes among its activities the evaluation and dissemination of existing health care technologies and new products of biomedical research. The Office for Medical Applications of Research (OMAR) of the NIH is charged with this responsibility.<sup>28</sup>

OMAR's primary goal is to help bring the results of biomedical research into direct use in the practice of medicine. To this end, it acts to coordinate consensus development activities at the NIH for evaluating technologies (in the broadest sense) and promulgating opinions about how to apply them. The consensus development activities consist of all the tasks needed to bring together selected, concerned individuals to reach general agreement about the safety, efficacy, and appropriateness of using various medical procedures, drugs, and devices. In essence, the NIH provides the setting and necessary resources for a mix of practicing physicians, researchers, consumers, and others to come together and jointly evaluate an existing technology. By the end of 1983, over 40 consensus panels had been held. The results had been published in many professional journals.

A major contribution of the NIH consensus panels has been to describe current levels of agreement on important topics like coronary artery bypass surgery, intraocular lens implantation, cesarean section, Reye's syndrome, and the treatment of breast cancer.

#### Glaser's State-of-the-Art Approach

The Glaser approach to consensus,<sup>29</sup> used most successfully for describing current knowledge on chronic obstructive pulmonary disease (COPD), can be visualized as a series of tiers or levels, each dependent upon or interacting with the bottom or principal level. As Glaser has used it, a core is constituted that consists of a small group of physicians whom Glaser himself invites to participate. This group, in turn, nominates its own choice of additional members from an internally generated list.

For COPD, the group (guided by Glaser, whose role was that of facilitator, coordinator, and administrator) first drafted an initial position paper. After suitable revisions, it was subjected to a series of rounds or critiques by physicians and other health care professionals who, because of their prominence in the area of COPD, were identified and requested to participate in the project. Following the receipt of comments by the outside reviewers, the members of the core group redrafted the position paper until they found it to be generally acceptable. The last set of comments was incorporated into a final draft, written principally by a member of the core group.

Several characteristics of Glaser's approach were designed to ensure visibility. First, the group tried to build as great a degree of support for its work as possible. This effort began by having prominent individuals determine that a real and definite need existed for a comprehensive statement clarifying the level of knowledge about COPD. In addition, at every level of discussion of the consensus document, the group invited prominent individuals and organizations to

participate by adding criticisms and comments. In fact, the final document has been endorsed by those medical groups in the US that have a major concern with pulmonary disease.

Glaser's approach requires a leader who is not an expert in the field, but who has credibility with physicians while not necessarily being a doctor. Its applicability to other fields has not yet been evaluated, but Glaser asserts that success is likely if the consensus is presented appropriately and made readily available to potential users (perhaps with incentives like access to technical assistance).

*Discussion*

Ideally, the solutions to problems in health and medicine would be based on definitive information obtained from scientifically sound studies. In practice, however, this is not always possible. Furthermore, the results of experiments by themselves seldom lead directly to a course of action. They must be evaluated and combined with other data and opinion in order to be truly useful. The hope for formal consensus techniques is that, when properly employed, they will create an environment in which experts are given the best available information, and will allow their solutions to problems to be more justifiable, valid, and credible than otherwise. But how is it possible to avoid producing the lowest common denominator of agreement and, at the same time, promote wise action? Several themes emerge that might be used as a guide in achieving the hopes for consensus. These, listed below, concern the selection of problems, organization of panels, choice of leaders, access to data, level of agreement, and support and dissemination of findings.

*Consensus studies should focus on carefully defined problems that can be investigated in a timely and economical way.*

A basic tenet of all consensus strategies is that solvable problems must be selected. One of the major benefits of consensus is that answers to questions such as the following can be produced efficiently in a reasonable amount of time:

- What form should a survey instrument take that is designed to identify priorities for State Allied Health Associations?<sup>13</sup>
- What is the best choice of treatment for an isoniazid-resistant tuberculous infection?<sup>11</sup>
- What form should a plan take for a continuing education program for staff members and consumer boards of health centers?<sup>21</sup>
- How can both consumer and professional definitions of the roles of primary health care organizations be effectively united?<sup>30</sup>
- What is the state-of-the-art in the management of chronic obstructive airway disease?<sup>29</sup>
- What is the appropriate use of coronary artery bypass surgery?<sup>28</sup>
- What are standards for evaluating quality of care for selected medical problems?<sup>31</sup>

*Decisions on important issues should be justified by reliance on available empirically-derived data as well as on judgments and experience.*

In this less than perfect world, consensus studies are intended to correct for the lack of conclusive data by putting the knowledge and experience of practitioners and other experts in touch with the available information. Thus, a major challenge in a consensus process is to cull from existing sources all appropriate information and to synthesize it into a form that can be used. In the absence of such a synthesis, participants in a consensus study tend to rely

solely on their own, possibly limited, experience and reading.

Unfortunately, available data are often of uneven quality, difficult to obtain, not comprehensive, and supportive of very different positions. Conclusions based on these data vary in validity because of the strength of the research design and analysis from which the data come, the size or representativeness of the research sample, and the reliability and validity of the data collection process.

To help in the consensus process, findings—regardless of their dissimilarities or controversial nature—should be summarized *critically* in a background paper and reported to the participant with estimations of their reliability. The methods and standards used to arrive at the estimates should also be provided.

Small-scale studies—the type that seek consensus for problems that are likely to have only a limited impact—require less investment in synthesizing available data and estimating their quality.

*Consensus participants should qualify for selection because they are representative of their profession, have power to implement the findings, or because they are not likely to be challenged as experts in the field. It is also advisable to include potential consumers whenever appropriate.*

The results of consensus studies derive their credibility, in part, from the composition of the consensus panel. All current consensus strategies assume that the participants can produce sound decisions and that these will be listened to in the proper circumstances. For example, the problem of setting criteria for the use of generic versus brand-name drugs might best be tackled by a panel of prominent pharmacologists and pharmacists, as well as physicians and public consumers.

The number of participants will vary according to the built-in requirements of the particular consensus technique being used, the scope of the problem, and the available resources. Some techniques require highly structured, face-to-face interactions and fewer than 15 participants, e.g., the nominal group. Arriving at consensus for large-scale problems (whose solutions are costly and can affect many people) probably requires larger panels. Each additional consensus participant adds to the total cost of the process. Therefore, the size of the panel should be commensurate with the amount of money available and reflect the desire to produce a sound answer that will have a high likelihood of being accepted.

*Objective and skilled leaders should administer the consensus process.*

Consensus strategies place varying amounts of responsibility on the group leaders. With the Delphi technique, for example, the leaders are removed from the participants, and their primary responsibilities are to coordinate the survey and interpret the results. In nominal group consensus studies, however, leaders meet face-to-face with panelists and are responsible for defining the problem, deciding when each step in the nominal group process has been adequately completed, keeping the group on schedule, and deciding when agreement has been reached. The nominal group leader is also a participant, and must therefore have subject-matter expertise. In contrast to nominal group, Glaser's approach, which also relies on personal contact, depends on leaders who have expertise in facilitating group processes, but who are not subject matter experts and not likely to be in favor of any specific solution to the problem or otherwise prejudiced.

It is probably best that consensus panels have leaders whose disinterested position is unquestioned by any of the concerned parties, but whose expertise in coordinating groups of health professionals is accepted by all. Reliance on an individual who is identified with a given field, who can be viewed as an advocate of a particular position, or who would use the results of the consensus study to further personal interests might directly or indirectly influence participants' behavior and, therefore, bias the outcomes. A skillful leader must focus participants' attention on the topic, rather than on secondary issues and personality conflicts.

*The level or type of consensus must be defined in advance.*

There are many kinds of criteria for describing when consensus is reached. Among them are the following:

- On the final vote, any topic or issue supported by at least X per cent of participants is adopted.
- After five rounds of voting, the X number of topics receiving the most votes are approved.
- All topics are rated on a scale of 1 to 5. Only those topics receiving a mean rating of 3.0 or greater are accepted.
- All topics are rated on a scale of 1 to 3. All topics receiving a rating of "1" from at least 51 per cent of participants are adopted.
- Any topic is dropped if it is vigorously opposed by at least X per cent of the participants.

There are no firm rules for establishing when a consensus is reached. The stricter the criteria, however, the more difficult it usually is to obtain consensus. Typically, panels are given about 15 minutes to discuss a given consensus item. If agreement from at least two-thirds of the participants can be reached within this time limit, consensus is established. Otherwise, the item is deferred for a later discussion. *Consensus findings should represent clear and specific guides to action.*

Consensus findings may be stated very generally or in great detail. In a study intended to select outcomes of a geriatrics curriculum, for example, a generally stated consensus finding might be "to improve the health care for the elderly," while a specifically stated one would be "to name the five most common neurological problems affecting American men 55-70 years of age or older."

A review of consensus findings from the NIH<sup>32</sup> shows that some results are action-oriented. For example:

"All females who have had sexual intercourse should be screened for cervical cancer:

- Screening should be initiated soon after the beginning of sexual activity
- If the first smear is satisfactory and does not indicate evidence suggestive of neoplasia, the smear should be repeated in one year;
- If the second smear is also satisfactory and negative, rescreening of majority of healthy females should be repeated at regular intervals of one-to-three years."<sup>32</sup>

Others are more general:

"Anticonvulsant prophylaxis in therapeutic levels may be considered under any of the following conditions: (a) in the presence of abnormal neurological development, (b) when a febrile seizure is longer than 15 minutes or focal or followed by transient or persistent neurological abnormalities, and (c) history of nonfebrile seizure of genetic origin in parent or sibling."<sup>32</sup>

Specifically stated consensus findings are more amenable to action and less likely to be subjected to misinterpretation than are generally stated findings, but more of them are

needed to fully define an area. General statements are sometimes assigned a false importance since they appear to encompass more content than do the specific ones.

*Large-scale consensus studies should seek professional and political support.*

To help promote the use of consensus results, the support of professional and other interested groups should be sought. The support can take the form of representation on consensus panels with both potential advocates and their adversaries being invited as participants. One way to include as many people as possible, while still keeping the core panel manageable, is to invite powerful or knowledgeable individuals to serve as reviewers of some or all of the consensus study's outcomes. Another type of sponsorship is financial support from a professional society, foundation, government agency, or private organization for all or part of the consensus study. Finally, these same groups can be enlisted to disseminate or guarantee use of the findings.

The NIH and Glaser consensus approaches incorporate the principle of gaining professional and political support for their studies. In his consensus study for COPD, Glaser relied on a core group of highly regarded scientists, and each draft of work was sent to a pool of outside experts, who were members of the National Heart, Lung and Blood Institute (NHLBI) or the American Lung Association. All participating individuals were informed of progress on the COPD study, and every attempt was made to incorporate their views.

Panelists in NIH consensus studies have included researchers in relevant fields, members of the pertinent clinical specialties, and, when appropriate, representatives of consumer advocate groups and the general public. By attempting to make its panels as representative as possible, the NIH has sought to ensure that the recommendations of its panel will be acceptable to the greatest number of people.

*The impact of consensus studies can be improved through careful dissemination of the findings.*

In order to have consensus findings used, they must be publicized. If the findings are intended for private practitioners, they can be presented at appropriate professional meetings, in publications, in continuing education programs, or by means of a direct mailing of results to those physicians. Public and private agencies with health interests should receive reports or presentations especially prepared for them. If the public is to use the results of consensus studies, it can be most easily reached through radio, television, newspapers, and magazines.

To ensure that the results of its consensus process are disseminated to all interested members of the medical community and the public, the NIH, for example, endeavors to: 1) invite media representatives to its conferences, and hold a press conference at the end of each consensus meeting; 2) distribute the final consensus statements to a mailing list of over 21,000, including continuing medical education directors, medical libraries, participants in previous conferences, and other individuals who have requested such information; and 3) seek publication of complete consensus statements in appropriate professional periodicals (e.g., *Annals of Internal Medicine* or the *New England Journal of Medicine*), publish an abstract of the consensus statements in the *Journal of the American Medical Association*, and present information on the consensus program to various medical groups through the use of exhibits at many large professional association meetings. The NIH staff also makes formal presentations concerning the consensus concept at medical conferences

and symposia concerned with technology assessment and transfer.

*The dissemination and use of the solutions to problems addressed by consensus techniques should be monitored.*

All consensus studies, regardless of size, require expenditure of time and effort. Therefore, it is reasonable to hope that the findings will be used with beneficial effect. Monitoring of both potential negative and positive outcomes from these studies is required to determine if this hope becomes a reality. Sometimes, monitoring the use of consensus results is relatively simple. For example, if the purpose of the consensus were to choose a division chief and the designated person was chosen, then not much follow-up would be needed. At other times the monitoring can be complex, as it might be if the goal were to change physicians' practices on a national level. In such cases, sophisticated survey and field research would be required. The NIH has only now sponsored a formal evaluation of the merits of its consensus approach. The results of the evaluation will help build a body of knowledge about the validity of consensus studies.

A recent paper discussing some of the results of a Delphi strategy<sup>33</sup> partially addressed this important issue. The Delphi, conducted by the Association of Pathology Chairmen, assessed their expectations for the future. A review of the study's projections six years later suggested its usefulness in directing activities toward achieving important goals that the Delphi has identified. Because of the success of the first effort, a second effort, with a broader community of pathologists, was recommended.

*Summary*

Formal consensus methods have become part of the technology for solving problems in health and medicine. Although their validity and reliability have not been scientifically established, their format and results seem so successful that supporters of consensus appear to outnumber detractors. But can consensus methods live up to their promise of creating structured environments in which expert judgment and clinical data can be wisely combined? The answer to this question will only come with time. Meanwhile, to help ensure that consensus methods produce useful and credible outcomes—at least on the face of things—it is probably important to be attentive to the themes that emerge from the literature. Among these are the need to carefully select problems that are amenable to solution by consensus, closely monitor the choice of panels and their leaders, identify justifiable consensus levels, and then make sure the findings are useful and accessible.

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