The Delphi Technique In Developing International Health Policies: Experience From The SARSControl Project

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Citation

Abstract

The overall aim of this methodological study was to evaluate the Delphi technique as a tool to develop international policies for SARS and SARS-like diseases using criteria found in the literature and its application in the SARSControl Delphi study. The main weaknesses in the Delphi process were found to be -the lack of experts in infectious diseases amongst the Delphi team, the 9-point Likert scale without clear verbal labels, lack of representatives from countries with SARS experience, discontinuity in the Delphi panel composition from the 1st to the 2nd round to the face -to-face meeting and delays in data gathering due to collaboration with another project. It can be concluded that from the results that Delphi technique when rigorously administered, analyzed and reported is a valuable method to develop international health policy recommendations for emerging infectious diseases and aid the international policy development process creatively collecting expert opinions and suggestions.

SOURCE OF FUNDING

INTRODUCTION

Development of international health policies has proven to be an urgent and crucial issue in containing emerging infectious diseases such as SARS and threats of pandemic influenza. International Health Regulations have been updated to meet the new challenges. Surprisingly, there is hardly any published documentation on how policies are developed other than the use of methods such as consultations, technical meetings, and workshops of experts and key stakeholders. Without formal and transparent documentation on exactly how these methods have been used, and how well they have functioned, it is impossible to use available evidence in systematically developing policies.

The Delphi technique, originally developed by the RAND Corporation [1], helps in structuring a group communication process that is particularly useful when there is little knowledge or uncertainty surrounding a complex area being investigated [2,3,4,5]. Van Zoligen & Klaassen [6] classify the Delphi technique into: the Classical Delphi - to establish facts; the Policy Delphi -to generate ideas; the Decision Delphi -to make decisions; and the Group Delphi -for group discussion. No studies are reported in the literature on the use of Delphi technique in developing infectious disease policies. It has been used in other areas of healthcare such as identifying priorities in clinical guideline development mental health [7], and in advocating tobacco control [8]. Barker's analysis of methods and techniques to analyse and develop health policies showed the Delphi technique to fit well for issue definition , objective/priority setting, both process and substance, prescriptive as well as explanatory use, and mostly for qualitative data [9].

The Delphi technique needs to be applied systematically and rigorously to produce reliable and valid results [7] and to avoid discrepancies [10]. Based on literature, the five core criteria when using the Delphi technique (Table 1) are: a) panel composition (geographic and professional representativeness, size, heterogeneity [11,12]; b) participant motivation (response rate, written consent, clarity of questions, reminders; c) problem exploration [13]; d) consensus definition e.g. as percentage of agreement /medians [7,14]; and e) format of feedback e.g. individual responses, measures of tendency and spread of responses [5],

different statistical description using median, mean or percentage [15] which can decrease unnecessary disagreement [16]. Other criteria include - number of rounds, anonymity to encouraging open expression of opinions [17], and sufficient resources which include time and administrative services [18]. Appropriately addressing the issues while carrying out a Delphi process, determines efficient application of the method to obtain the desired result (Delphi outcome). The methodological challenges while carrying out a Delphi to develop emerging infectious diseases sparked this study.

SETTING AND METHODS

The European Community funded research project SARSControl (more information available at www.sarscontrolproject.org) included 17 international organizations. Its policy evaluation work package was the setting of this study and the basis of our study was the SARSControl hence, data and results from it have been used for our analysis. Delphi results of the SARSControl study are available on the project website and have also been submitted as a separate manuscript[19] describing in detail the outcome of the Delphi-process i.e. international policy recommendations developed for SARS and SARS-like diseases.

This paper uses the criteria defined in the literature to assess the process of using the Delphi technique in one of the largest up to-date projects aimed at developing international emerging infectious disease policies. The criteria listed in table 1 were used to evaluate the application of the Delphi technique. The evaluation was done using the qualitative description of the SARSControl Delphi and carrying out a critical analysis of different aspects of each criterion.

Figure 1

Table 1: The Delphi technique: key features of design, administration and analysis of the data

RESULTS
GROUP COMPOSITION AND PARTICIPANT MOTIVATION (SEE TABLE 2)

The Delphi process, which was carried out over a period of nine months consisted of a pilot round, two written rounds and a final face-to-face meeting. Sixty infectious disease experts who were national experts in the field of infectious diseases who working at senior levels nationally and internationally, and represented their country on the Advisory Forum of the European Centre for Disease Control, Stockholm (ECDC) were approached. Of the 60, 47 accepted the invitation-written consent was obtained from them. Thirty-eight experts (from 22 countries) participated in the 1st written round and 28 experts (from 19 countries) in the 2nd written round; and 11 newly recruited experts with similar expertise as the participants from the written rounds (as five panellists invited from the written rounds were not able to participate) from 9 countries participated in the face-to-face meeting. A possible explanation for this is that as national experts, they were extremely busy, and also the panelists were not invited early enough and nor were they informed of it at the recruitment phase. Two reminders were sent after the written round invitations. The response rate for the 1st round was 80% and the 2nd round was 74%. Seven replies received after the face-to-face meeting were excluded from the analysis. Misinterpretations of questions in the written rounds were rectified by either deleting or clarifying them in the 2nd round questionnaire.

Figure 2

Table 2: Accomplishment of the process criteria in the SARSControl Delphi study.

Criteria		1st round	2nd round	Face-toface meeting
Group composition	Panel size	• 60 invited • 47 accepted • 38 responded	• 38 invited • 28 responded	• Five 1st & 2nd round participants invited – all declined • 11 new participants
	Geographic representation	• 21 EU countries • 1 S.E. Asian • 5 EU countries with SARS experience	• 18 EU countries • 1 S.E. Asian	• 9 EU countries
	Expertise/ Heterogeneity	• Epidemiologists • Public health specialists • Communicable disease experts/advisors • Virologists • Medical sociologists • Pharmacists • Physicians		• Health policy experts • Epidemiologists • Mathematical modeller • Medical ethicist • Infectious diseases experts
Participant motivation	Written consent	Yes, before the 1st round		
	Reminders	Yes	Yes	NA
	Clarity of the questions	Unclear questions corrected in the 2nd round		
	Response rate	80 %	74 %	all new participants
Problem exploration		Close-ended questions based on existing literature with a 9-point Likert scale		
Consensus		75 % agreement		
Feedback		Panel members were fed back with percentages of agreement within the panel for each individual statement, and summaries of the comments made by the respondents in the written rounds.		
Anonymity		Yes		No
Resources	Time	Written rounds took both approx two months each to complete		10 days
	Financial	No constraint		Constrains due to lack of planning
	Human	One full-time research assistant, one part-time student-assistant and a supervisor		
	Channel	Email		Group discussions

The Delphi panel participants consisted from various health-related disciplines, however their specific experience with SARS was not known. Other relevant specialists for e.g. behavioural scientists and communication specialists were not included in the Delphi panel. European countries were well represented- France, Germany, Singapore, Sweden and the U.K. were countries with experience of 'probable' SARS cases. Learning from Chinese and Canadian experiences was one of the aims of the project. Two experts from China (with the most SARS experience) were invited to the written rounds but they were unable to participate. Canadian experts were not invited.

PROBLEM EXPLORATION AND CONSENSUS DEFINITION (SEE TABLE 2)

Thirteen policy components considered important in terms of emerging diseases were used to formulate statements for the written Delphi rounds: National pandemic plan; Surveillance indicators, Laboratory capacities; Triage policies; Roles and responsibilities of central and regional levels; Cooperation between neighbouring countries; Antiviral drugs; Vaccine strategies; Impact on health care systems; Maintenance of essential services; Non-medical interventions; Communication strategies; and Travel policies. The selection of policy components was based on

the Hazard Analysis of Critical Control Points [20] carried out within the project, intra-project input, the CDC document [21] and other recent literature. The first questionnaire was closed-ended with a possibility to make comments. The draft questionnaire was sent for pilot testing to external experts (n=3), the SARSControl work package leaders (n=9) and project coordinators (n=2). Replies were received from the three external experts only, and the questions were edited based on their replies. The written round questionnaires used a 9-point Likert-scale, in which verbal labels were used only for the extreme categories. This caused confusion among the participants. The replies to the statements on 9-point Likert scale were grouped into three sub-categories for analysis (1 to 3 - completely disagree, 4 to 6- neither agree/nor disagree and 7 to 9 - completely agree) and consensus was defined as 75 % or more of replies falling either in the completely agree or completely disagree sub-category. The written comments (qualitative data) provided by the respondents were individually analysed. The questionnaire for the 2nd round was based on the results and comments received in the 1st round. Questions which had reached consensus in the 1st round were excluded from the 2nd. Unclear and confusing questions were either rephrased or new questions were formulated based on the panellists' comments. The written Delphi rounds produced consensus among the experts in seven out of thirteen policy issues addressed. Unclear questions from the 1st round to the 2nd were dropped in the course of the Delphi written process. The reason for the confusion was that the first questionnaire was formulated to be answered keeping in mind general pandemic diseases and respondents stated the answers to some issues (mainly questions on use of anti-viral drugs) would be different for different diseases.

FEEDBACK, NUMBER OF ROUNDS AND ANONYMITY (SEE TABLE 2)

Panel members were fed back with percentages of agreement within the panel for each statement in every round. Summaries of the comments from the previous rounds were also given. Comments - given by one third of the Delphi panelists in the written rounds, consisted of additions and clarifications as well as alternative, innovative disease control strategies. Prior to the face-to-face Delphi meeting, its participants were informed via email about the Delphi technique and about the results of the written Delphi rounds. This was done to ensure that the participants had a common starting point as none of them had participated in the written rounds. The questionnaire responses were anonymous to

other participants.

RESOURCES (SEE TABLE 2)

Email as a data gathering channel functioned well, few replies were received by ordinary post: the rounds took two months each. The date of the final face-to-face meeting had been agreed six months in advance, which meant that the written rounds needed to be finalized well ahead of the meeting. The delays led to insufficient time to collect back the 2nd round questionnaires and analyze the data (approximately 10 days). Seven questionnaires received after the face-to-face meeting and were excluded from the formal Delphi process. Financial resources had been foreseen but the expenses for the consensus meeting had not been planned. This limited the number and range of the experts invited to the face-to-face meeting, e.g., no experts could be invited from China or Canada. The three person research team had no expertise in infectious diseases. The written rounds were carried in collaboration with another research organization as they had planned a similar Delphi among the same group of experts. The collaboration meant that the combined written questionnaire became very long and tedious which potentially increased dropout, and deadlines had to be negotiated for the convenience of both studies. The collaboration resulted in delays and was also the reason for excluding seven 2nd round replies from the Delphi analysis, which meant decrease in the response rate. A separate analysis including these excluded replies showed that four statements would not have met the consensus criteria of 75 %. Had these been received on time, the four statements would have been included as topics of discussion at the face-to-face meeting. However, they were dealt with anyway at the face-to-face meeting – for the reason that policy areas were discussed broadly and not only based on statements.

Even a good quality and smooth Delphi process needs to deliver an outcome. For the SARSControl Delphi the outcome was draft policy options for emerging infectious diseases at an international level. The draft policy options produced are submitted as a separate manuscript [19] (currently under review) covered the policy areas for SARS listed by the CDC's document [21]. In addition, other themes that came up during the Delphi process were: benefits of having a generic pandemic preparedness plans, criteria for testing them, and enabling universal access to healthcare during outbreak were identified and agreed by experts the need for research in the field of emerging infectious diseases, need for political collaboration, allocation of

national resources to local levels, and improvement of monitoring and surveillance systems. A comparison of these components with the policy areas covered in the WHO checklist for pandemic preparedness planning (2005) and the ECDC pandemic preparedness planning document (2007) shows that a majority of the areas were included, only issues such as case investigation, treatment, trade, legal and ethical issues were not covered at all in the SARSControl Delphi.

DISCUSSION

This is the first methodological study to assess the Delphi technique in developing international infectious disease policies. Although this is a case study within one project, it exemplifies some crucial issues in applying the Delphi technique. The major strength of the policy Delphi used was its ability to ascertain expert opinions and potential policy options, including new alternative ones, from countries representing different cultures and health policies on the timely issue of infectious disease control. This contributed to the policy recommendations to be put forward to policy makers to agree upon. The major weakness of the Delphi was that the panel represented mostly European experts, missing countries with most SARS experience, and also the discontinuity from the written rounds to the face-to-face meetings due to drop out and financial constraints.

A rather homogenous professional representation in the Delphi panel on the other hand was not necessarily such a drawback since the aim was to generate feasible policy recommendations and alternative and innovative strategies, and according to Adler and Ziglio [1] this can be achieved also with more homogeneous panels. Use of pre-existing information increases the effectiveness of the Delphi process [22]. The SARSControl Delphi used information from the literature, HACCP analysis and from other work packages within the SARSControl project in developing a close-ended questionnaire worked well. Addressing emerging infectious diseases generally was a drawback in the 1st questionnaire as it led to misunderstanding of some questions. The lack of an infectious disease expert in the research team was possibly the reason for inappropriate question formulation. Anonymity in the written rounds provided an opportunity to express opinions openly without feeling pressure by others. This most probably ensured truthful replies making the results more reliable as stated by Goodman [17] and Couper [23].

The use of 75 % cut off, which is in line with McKenna et al.

[24] and Kilroy & Driscoll et al. [25], proved to clearly differentiate the consensus and non-consensus results. The use of a wide 9-point Likert scale had only the extreme values labeled verbally which probably led into different interpretation of the categories. A more narrow scale with clear verbal labels might have been more informative. However, the comments written by the panelists clarified and brought useful additions. The feedback of the written Delphi rounds given to the participants ensured that all the views were explicitly presented and common interpretations of the variables and responses were established. These procedures prevent unnecessary disagreement among participants [16].

The two written rounds of the Delphi and a face-to-face meeting were found sufficient to obtain the outcomes in terms of generating policy options and alternatives. The 2nd Delphi round was crucial in clarifying issues from the 1st round. Thus the SARSControl Delphi process succeeded in its aim to generate policy options and alternatives - this in spite of the discontinuity in the involvement of the experts throughout the Delphi process.

Consensus was reached on most of the issues put forward in the SARSControl Delphi questionnaires. Non-consensus questions on non-medical interventions were taken up in the face-to-face meeting and experts suggested solutions to them. Further, alternative strategies were suggested to prevent and control future spread of SARS and SARS like diseases. These measures would improve also transferability of the research-based knowledge from SARS to other potential infectious disease outbreaks.

The range of the policy areas covered by the SARSControl Delphi covered all the areas listed by the CDC document (CDC, 2004). The outcome of the Delphi gave statements with opinions of experts on the vast policy areas, which need to be considered in preparedness and response to an outbreak of SARS or SARS-like diseases. These opinions coincide with what was reportedly found to have worked and not worked during the 2002/2003 SARS outbreak and gaps identified in planning and response of pandemic influenza by Coker and Mounier-Jack [26], hence it can be said that the Delphi technique validated the earlier findings.

In the absence of published methodological literature on the Delphi application on international infectious disease policy development, it is not possible to compare directly the results of this study with the previous ones in the field. Its

use in other areas e.g. mental health to develop clinical guidelines, tobacco control to develop tobacco polices etc. has been shown to be very fruitful. The use of the Delphi technique in comparison to other methods such as consultations, meetings etc. highlights its strengths as systematic group communication process allowing it to deal with a complex problem by gathering expert opinions . It also brought about new and alternative policy options. In terms of resources, Delphi is quick and cheap. It enables participation of a vast number of geographically dispersed individuals.. The technique also gives more transparency to policy development as compared to other methods for e.g. IHR has been reported to have been developed using meetings and consultations, however, no published information is available on the development process [27,28]. As an overall impression from the Delphi process and the policy options developed, it can be said that it was a positive experience in terms of developing policy options and alternatives.

Use of explicit, published criteria meant that information considered relevant was gathered. The reliability of this study was strengthened as the assessment of the Delphi technique was done based on the criteria reported in the literature for the Delphi process. The validity of the results will only be found out when the policy recommendations will be tested by presenting them to politicians and decision makers for their judgment, and this remains to be tested.

CONCLUSIONS

The Delphi technique can aid the international policy development process and it can be a versatile tool, which creatively collects expert opinions and suggestions in a new topic. Central criteria to be met include representative panel composition, high panelist motivation, and effective but flexible administration of the Delphi process. Based on the assessment of SARSControl Delphi technique, it can be concluded that when rigorously administered, analyzed and reported, is a valuable method to develop international health policy recommendations for emerging infectious diseases, even though discrepancies in its application existed. The SARSControl Delphi technique was a positive experience, and can also be considered by others for similar purposes.

COMPETING INTERESTS

The contents, analysis and arguments of this manuscript have not been copyrighted or published previously nor being

considered for review elsewhere. However, data of this manuscript have been used in an unpublished MSc thesis defended at the Unit for Health Promotion Research, University of Denmark, Esbjerg, Denmark.

In addition, a manuscript using the data from the same research project but with different research question, different analysis and results, has been re-submitted to another journal, where it is currently under review. We are willing to send this related manuscript for information, if requested.

AUTHOR CONTRIBUTIONS

All authors have contributed in designing the study, gathering the data, doing the analysis, and interpretation of the results. Ahmed M. Syed did the main writing but all authors commented and contributed and all authors have accepted the final version. The study was supervised by Arja R. Aro.

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