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An Experimental Use of Delphi Method for Understanding Chemists' Opinions Related To Medications for Swine Flu

By Dr. Harishchandra Singh Rathod & Dr. Mamta Brahmabhatt

Gujarat Technological University

Abstract - This paper critically evaluates the Delphi Technique as a qualitative research tool and its application in an unexplored topic. The aim to select the Delphi Technique as a research tool is because of its limited use in Indian research methodologies. Researchers aimed to explore this technique and critically evaluate it because of its accuracy of getting results for the desired problems. In order to critically evaluate, assess and implement Delphi technique, researchers had undertaken an experimental study in 2010 during the outbreak of Swine Flu in India. Study was conducted in Gujarat, a coastal state situated in western India.

The paper states that Delphi method recognizes human judgment as a legitimate and useful input in generating forecasts and therefore highlights that the use of experts, carefully selected, can lead to reliable and valid results. In addition, the research paper tries to overcome the weaknesses implicit in other methods such as relying on a single expert, a group average, or a round table discussion. This study will help future researchers apply the qualitative research tools in practical life and understand how useful and feasible they are in solving the issues. By using this technique, researchers could get valuable insights on what actually is the process of acquiring the license for swine flu medications and business implications for companies engaged in manufacturing of these medicines.

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An Experimental Use of Delphi Method for Understanding Chemists' Opinions Related To Medications for Swine Flu

Dr. Harishchandra Singh Rathod^a & Dr. Mamta Brahmabhatt^c

Abstract - This paper critically evaluates the Delphi Technique as a qualitative research tool and its application in an unexplored topic. The aim to select the Delphi Technique as a research tool is because of its limited use in Indian research methodologies. Researchers aimed to explore this technique and critically evaluate it because of its accuracy of getting results for the desired problems. In order to critically evaluate, assess and implement Delphi technique, researchers had undertaken an experimental study in 2010 during the outbreak of Swine Flu in India. Study was conducted in Gujarat, a coastal state situated in western India.

The paper states that Delphi method recognizes human judgment as a legitimate and useful input in generating forecasts and therefore highlights that the use of experts, carefully selected, can lead to reliable and valid results. In addition, the research paper tries to overcome the weaknesses implicit in other methods such as relying on a single expert, a group average, or a round table discussion. This study will help future researchers apply the qualitative research tools in practical life and understand how useful and feasible they are in solving the issues. By using this technique, researchers could get valuable insights on what actually is the process of acquiring the license for swine flu medications and business implications for companies engaged in manufacturing of these medicines.

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I. INTRODUCTION

The Delphi technique had its origin at the Rand Corporation in the early 1950s as a forecasting tool for the forces. Its purpose is to importune reliable responses from a panel of experts regarding a particular problem or dilemma.

This research tool permits researchers to combine the reports or testimony of a group of experts into one, useful statement.

Adler and Ziglio (1996) described the Delphi method as a communication process that is structured to produce a detailed examination of a topic/problem

and discussion from the participating group, but not one that forces a quick compromise. Thus, the structuring of group communications is an essential component of the Delphi.

Lintone and Turoff (1975) stated that this research technique allows educators, to communicate and effectively develop trends, needs, or other factors relative to a particular area of education.

Linstone and Turoff indicated that Delphi undergoes four distinct phases. The first phase is characterized by exploration of the subject under discussion, wherein each individual contributes additional information he feels is pertinent to the issue. The second phase involves the process of reaching an understanding of how the group views the issue (i.e., where the members agree or disagree and what they mean by relative terms such as importance, desirability, or feasibility). If there is significant disagreement, then that disagreement is explored in the third phase to bring out the underlying reasons for the differences and possibly to evaluate them. The last phase, a final evaluation, occurs when all previously gathered information has been initially analysed and the evaluations have been fed back for consideration

II. STEPS IN DELPHI

The basic Delphi Method begins with a series of first round questions asked individually of experts on the subject. The experts submit their judgments. The results of the first round judgments are then tabulated and the results sent back to the experts for modification. In real meaning, the experts are asked in the second round to reevaluate their original judgments in light of the average estimates calculated in the first round. This procedure of reevaluation is continued for several rounds until a fairly high degree of consensus is reached, or until the experts no longer modify their previous estimates.

Another technique for administering a Delphi survey is through a modified focus group. Here, the experts are allowed to interact face-to-face in the combined focus group sessions where the issues and answers to surveys are discussed. However, even with this technique, the actual survey questions should be answered by the experts in private. Delphi surveys can also be conducted through internet or bulletin boards for

Author ^a : Associate Professor at Shri Jairambhai Patel Institute of Business Management and Computer Applications (NICM Campus), Gandhinagar-382 007 (Gujarat, India) (Contact no: +91-23213043, 37 - 38 - 39) E-mail: drhsrathod@gmail.com

Author ^c : Associate Professor at Shri Jairambhai Patel Institute of Business Management and Computer Applications (NICM Campus), Gandhinagar-382 007 (Gujarat, India) (Contact no: +91-23213043, 37 - 38 - 39) E-mail: mamtanicm.brahmbhatt@gmail.com

expert discussion. For near-real-time Delphi surveys, researchers can use spreadsheet software to immediately evaluate Internet answers and provide immediate feedback to live discussion chat rooms.

The process for each type of Delphi is essentially the same; however, the purpose of a study determines the type of Delphi used. The Delphi's process is similar to the nominal group technique (NGT), except Delphi does not require the physical presence of group members (Mitchell & Larson, 1987). An interaction process takes place between the members of the group (Delphi panel) and the researcher.

One more literary work on Delphi technique has the following steps as suggested by Pfeiffer (1968)

1. The first questionnaire is sent to the panel of experts. Here a list of opinions involving experiences and judgements and a list of predictions and recommended activities are asked.
2. On the second round, a copy of the collective list is sent to each expert and experts are asked to rate or evaluate each item by some criterion of importance.
3. The third questionnaire includes the list, the ratings indicated, and the consensus, if any. The experts are asked to either revise their opinions or discuss their reasons for not coming to consensus with the group.

Brooks (1979) included an additional step prior to beginning the Delphi process: i.e.. Assess whether the panel members are willing to participate in the study or not. Brooks (1979) advised to use the following step in Delphi:

1. Identifying the panel of experts.
2. Determining the willingness of individuals to serve on the panel.
3. Gathering individual input on the specific issue and then compiling it into basic statements.
4. Analyzing data from the panel.
5. Compiling information on a new questionnaire and sending to each panel member for review.
6. Analyzing the new input and returning to the panel members the distribution of the responses.
7. Asking each panel member to study the data and evaluate their own position based on the responses from the group. When individual responses vary significantly from that of the group norm, the individual is asked to provide a rationale for their differing viewpoint while limitations are placed on the length of the remarks in order to keep responses brief.
8. Analyzing the input and sharing the minority supporting statements with the panel. Panel members are again asked to review their position and if not within a specified range, to justify the position with a brief statement.

III. SELECTION OF THE TOPIC: SWINE FLU MEDICATION- A BUSINESS PERSPECTIVE

The clarity on the topic of swine flu medications was very less. The sale of these medicines generated ample profit for the chemists during the outbreak of swine flu. The objective of carrying out Delphi Technique on this topic was to understand the business perspective of these medicine businesses. How have the chemists benefited by applying for license for sale of these medicines and is it a profitable business to enter into? How can the new stores acquire the Schedule X license? All these and various other questions were asked to the expert panel so that if a chemist wants to start trading in swine flu drugs then is it profitable to him, or an invitation to a long term hard work of documentation and proof maintenance?

The clarity lacked on the topic of swine flu during its outbreak. Now with various MNCs entering into manufacturing of generic versions of Tamiflu, the swine flu medicines did offer a more profit margin to the chemists. Delhi Technique helped to determine what the chemists' opinions were in foraying into the market of swine flu vaccinations.

IV. BRIEF HISTORY OF SWINE FLU IN INDIA

The first case of the flu in India was found on the Hyderabad airport on 13 May 2009, when a man travelling from US to India was found H1N1 positive. Subsequently, more confirmed cases were reported and as the rate of transmission of the flu increased in the beginning of August 2009, with the first death due to swine flu in India in Pune (Maharashtra) panic began to spread. The only known drug to work against H1N1(Tamiflu) was not sold in general medical stores, to prevent the virus from developing antibiotic resistance due to excessive use. The government feared that people would pop in pills for no reason, thereby making the virus resistant to its only known cure. The problem facing the state machinery was the fact that flu infected cases was coming from across the country.

The generic versions of Tamiflu were available in India under the name of Oseltamivir, Natflu and Starflu. The period from September 2009 to January 2010 saw a considerable rise in the sale of these medications from the time they were introduced in the Indian markets. Hetero Drugs Ltd, a Hyderabad-based drug-manufacturer, was the first Oseltamivir manufacturer to bag the million-dose Oseltamivir order from the government of India. The Oseltamivir order placed by the Ministry of Health, Government of India, on Hetero is estimated to worth between Rs 35-36 crore. Hetero is the only one Indian company that was licensed to produce Oseltamivir generic by Roche to be supplied

in India and other developing countries following a patent dispute with Cipla. Cipla Limited's version of Oseltamivir has recently been included in WHO's pre-qualification list. Besides Cipla, other companies including Ranbaxy, Natco, Strides etc also have developed capabilities to manufacture Oseltamivir.

V. METHODOLOGY USED

The widespread of the disease posed questions to the researchers -how can chemists be benefited by trading in the swine flu medicines? Is it easy to get the license especially when the government has decided to sell the medicines and not go for a retail format? And what future do these medicines hold for the chemists? Questionnaires could have generated a quantitative analysis but the opinions mattered a lot. The whole topic of swine flu medicines was very vague and so the best pathway to gather the perfect information was by conducting a Delphi Technique. Researchers conducted a focus group interview of the expert panel comprising of 5 chemists in Ahmedabad (Gujarat State) who dealt with the swine flu medicines.

The whole process and evaluation of the technique has been covered in the subsequent pages.

A valid Delphi process consists of minimum of 2 rounds, although the decision about the number of rounds is largely pragmatic. The purpose of initial iteration was to identify the broad issues related to the topic. Open ended questions were asked to the expert panel and analyzed qualitatively. The second round was more specific, with the questionnaire sought ratings on a five-point scale and a qualitative analysis. There happened to a convergence of opinions after the feedback.

VI. DELPHI PANEL SELECTION

Careful selection of the panel of experts is the keystone to a successful Delphi study. Key aspects include panel selection (including experts' qualifications) and size and participant commitment. Jairath and Weinstein (1994) suggested that study participants be experts who are knowledgeable about current information and perceptions regarding the topic under investigation but are open-minded to the findings. To motivate participants to remain active and complete all the rounds in a Delphi study, it is important they understand the goal of the study and feel they are a part of the group. Anonymity is an important Delphi technique characteristic. Without the identification of those contributing information or making specific judgments, candor may be increased.

a) *Size of the panel*

A variety of perspectives exist regarding the number of participants needed. Many support the opinion that the more the participants, the better (Murphy-Black, et al., 1998). However, Powell (2003)

also stated that, "There is very little actual empirical evidence on the effect of the number of participants on the reliability or validity of consensus processes". The number of participants in a Delphi study depends not only on the purpose of the study, but the variety of the targeted population. Ten to fifteen participants may be an adequate number for a Delphi study that is focused and where the participants do not vary a great deal.

There are no hard and fast rules. Linstone suggested a suitable panel size is even, but panel size varies from 4 to 3000. Therefore the decision of panel size is empirical and realistic, taking into consideration factors such as time and expense. Representation is assessed by qualities of the panel and not the numbers.

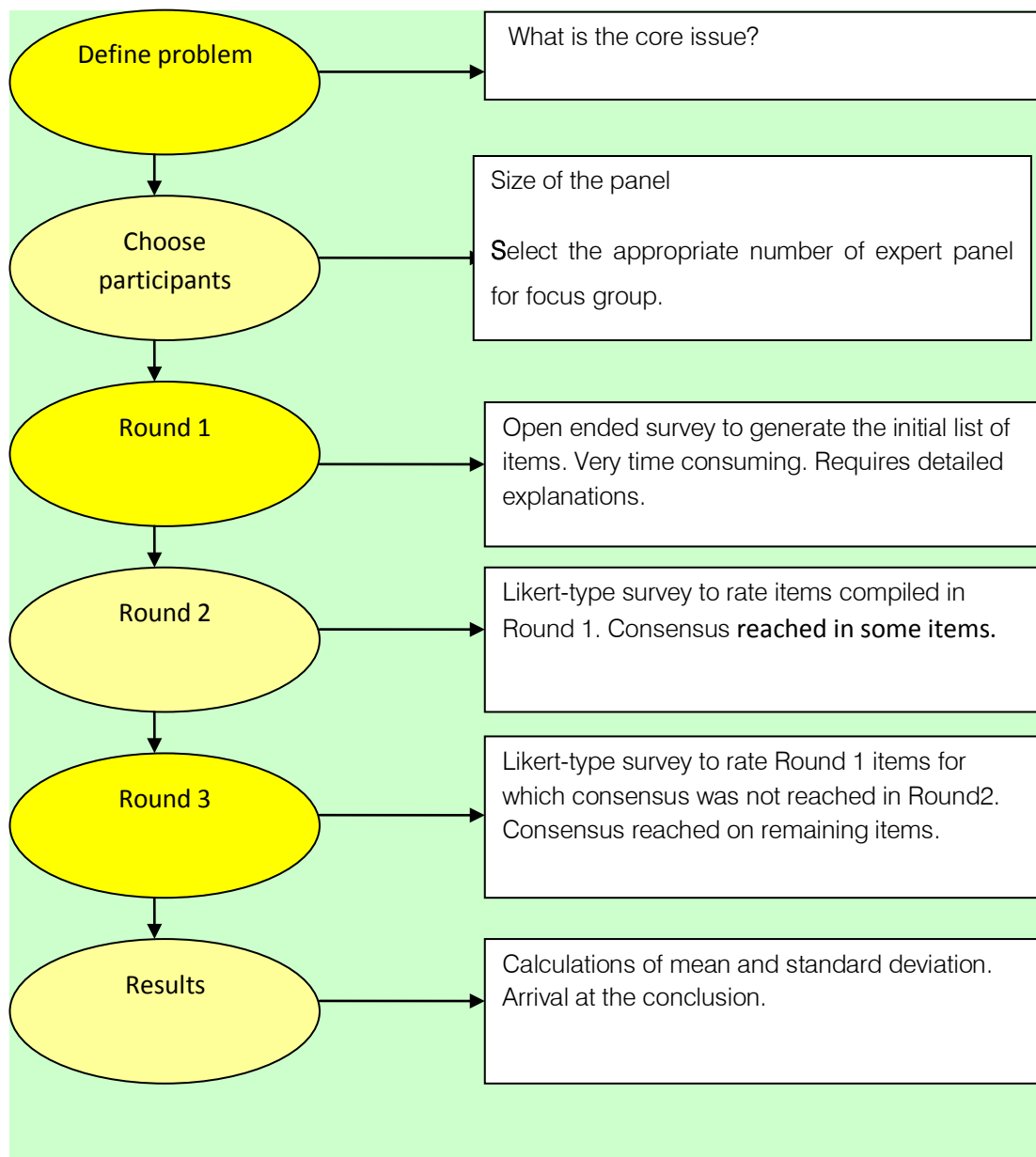


Exhibit 1: Methodology Adopted for Delphi

Round 1

The panelists were asked open-ended questions so as to have a brief introduction about the topic of swine flu medicines. The process was as follows...

1. How long have you been in the business of medicines?

A	-	10 years
B	-	25 years
C	-	18 years
D	-	8 years
E	-	20 years

2. The first case of swine flu was reported in India on 13th May, 2009. What was your reaction after seeing the death toll rise at a speedy rate?

A--	Panic, saw constant updates on the new virus that was claiming lives, asked his friends in the similar business as to what immediate solution is available to curb this disease
B--	Immediately called up his son in USA who is also in the similar business and enquired about the available medicines. The death toll was rising and there was lot of panicky amongst the localities. The government of India did not have any immediate cure to it and there was nothing that the doctors could do about it.
C--	Took time to take a grasp of the situation as everything was vague and people were asking for more of influenza medicines. The sales of normal flu medicines took a rise.
D--	Since there was no vaccine available and it was highly communicable disease, we started stocking more of masks. Apart from that no reaction.

E—There was no doubt a lot of fear amongst the people. The sale of flu medicines rose. The government contacts also did not help in getting the required medicine i.e Tamiflu, which was available in USA.

3. The government released the vaccination in form of generic versions of TAMILFLU, the patented swine flu medicine of Roche Company, under the name of Oseltamivir, Natflu and Starflu. Yet its sales were not allowed at the chemists shops. Why?

A—That is because the medicine was very expensive.

B—The versions were freely distributed in the hospitals and being an expensive medicine, the government took charge of distributing it amongst the victims and their relatives.

C—Maybe apart from the above reasons, fear of black market was there. The sale of drugs by chemists would have triggered the black marketing, soaring the price rates.

D—Same as what A said.

E—The stringent laws prevented the sale of Tamiflu generic versions. Furthermore compulsory licensing would have been thought of before selling these vaccines.

4. Do you think compulsory licensing for sale of swine flu medicines is an effective step taken by the government?

A—Yes as contents are subject to selected use.

B—Definitely yes. The sale of patented drug by the government does not have any risks of being sued for infringement if used for public non-commercial use.

C—No. Any chemist can sell them in near future.

D—I don't agree with C because the patients are required to bring 3 copies of prescription which is compulsory for issuing the medicine.

E—I agree with D. Also by just going for selected stores, black marketing can be prevented.

5. What is the current sale status of these medicines?

A—Dipped to all time low as even cases have reduced.

B—Sale was maximum between September to December-2009. After February-2010, sales have dipped.

C—Too low demand and stock has piled up in the stores.

D—Profit margin has reduced as sales have reduced.

E—Agree with the panel.

Round 2 And Round 3

After Round 1 which involved the discussions amongst the panel members, researchers could get valuable insights on what actually is the process of acquiring the license for swine flu medicines and how these medicines entered the Indian market.

In Round 2, researchers narrowed down the whole focus group by going for specific questions on a

rating scale. Hence spreadsheet was used to conduct the 2nd round of Delphi. Same process was repeated for Round 3, till consensus was arrived.

Here the panel members were required to rate the given criteria on scale of 1 to 5 on basis of agreement or importance they gave to that particular criterion. The concept of using spreadsheet was to allow the panel members to answer specific questions which were of interest to the researchers. After the rating, the panel members were allowed to discuss amongst themselves each criterion for 15 minutes. In case they wanted to change their ratings after the discussions, they were allowed to do so and then the spreadsheet was quantitatively analyzed.

The spreadsheet method of conducting Delphi is given as under:-

Criterion	Min	Max	Mean	Std Deviation
TamiFlu is the only available cure for swine flu	2	5	3.2	1.3038
Getting license is an easy task	1	4	2.6	1.1402
Reporting to the FDA staff	1	2	1.8	0.4472
Surprise audits happen by the Health deptt of Govt. of Gujarat.	1	3	2.2	0.8366
License is cheap	1	2	1.4	0.5477
Supply > Demand after March	1	2	1.4	0.5477
Schedule X certificate maintenance for 2 years is a compulsion and tedious task	2	3	2.2	0.1907
Profits were high during outbreak of swine flu	2	4	2.8	0.8366
Chemists get commission on sale of these medicines	4	5	4.6	0.5477
Patients given these drugs without prescription	4	5	4.4	0.5477
Lucrative business for new chemists	2	5	3.4	1.1402
Future sales will be high	2	4	3.4	0.8944

Exhibit 2 : Round 2

Criterion	Min	Max	Mean	Std Deviation
License is cheap	1	2	1.4	0.5477
Supply > Demand after March	1	2	1.4	0.5477
Reporting to the FDA staff	1	2	1.8	0.4472
Schedule X certificate maintenance for 2 years is a compulsion and tedious task	2	3	2.2	0.1907
Getting license is an easy task	1	4	2.6	1.1402
Profits were high during outbreak of swine flu	2	4	2.8	0.8366
TamiFlu is the only available cure for swine flu	2	5	3.2	1.3038
Lucrative business for new chemists	2	5	3.4	1.1402
Future sales will be high	2	4	3.4	0.8944
Patients given these drugs without prescription	4	5	4.4	0.5477
Chemists get commission on sale of these medicines	4	5	4.6	0.5477

Exhibit 3: Round 3

After this process, consensus was arrived on the criteria that:

- Trading in swine flu medicines is not so lucrative business as perceived.
- The future sales are not expected to be high.
- Patients are by no means given the drugs without the valid prescription. 3 copies need to be submitted to the chemist.
- Chemists do not get commission on sale of these medicines.

VII. BUSINESS IMPLICATIONS

- The results from the Delphi technique highlighted that the market for swine flu medicines did not pick up as per expectations of the chemists. Chemists did not gain anything by storing these medicines and lot of stock remains unsold.
- Swine Flu, declared as an epidemic for the said time period, Indian government hospitals provided these medicines for free so the inflow of patients buying these medicines from the chemists became very less. Hence, stocking the swine flu medicines is not so attractive venture for the chemists even for future.
- The license does not cost much, but the maintenance part of the documents is a very tedious work, which the chemists do not prefer much.
- Chemists can get first mover advantage by storing these kinds of medicines, but the profits are short lived. Once the epidemic gets over, there is nothing much to sell and demand decreases. So the contribution to the net turnover of the business of these medicines is not attractive.
- The players in these medicines business can benefit if they are in the market for quite a few years. The ways to acquire becomes easier for them and their existent customer base helps attract new customers in times of such viral outburst.
- The makers of these medicines have benefited after the government of India took the patent rights from Roche Company for manufacturing of generic versions of TamiFlu. Upcoming pharmaceutical companies can start ventures in exclusive manufacturing of swine flu medicines which they can export to other countries. Global market can prove profitable in countries where swine flu vaccines haven't been discovered and imported medicines cost an elephant.

VIII. CONCLUSION AND FUTURE SCOPE

This research technique allows educators and researchers communicate and effectively develop trends, needs, or other factors relative to a particular area under consideration. In selecting the most appropriate research tool, a researcher should ask the following questions, Who should communicate about the problem what alternative mechanisms are available for that communication, and what can we expect to obtain with these alternatives?" Depending on the answers to these questions, one may then choose the Delphi as the most effective research tool for the study at hand.

By applying Delphi Technique to the issue of Swine Flu Medication, researchers wanted to focus on the usage of Delphi to bring out useful inferences for future researchers. Moreover, researchers foresee a

great scope of effective usage of Delphi if used for addressing the following issues:

- Gathering information about historical events where exact or accurate information is missing.
- Evaluating the proper allocation of financial and budgetary resources
- Suggesting new plans and schemes for urban and rural development.
- Planning course curriculum and new teaching methodologies at Educational Institutes.
- Putting together an educational model.
- Outlining potential policy issues and available policy execution alternatives
- Distinguishing and illustrating real and perceived human behavior related to new product adaptation, usage and disposal.
- Discovering priorities of ethics at workplace, social goals, etc.

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