# Planning a Coordinated Local Health Care System Response to a Pandemic Using an Accelerated Delphi Technique: Phase 1

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## ABSTRACT

**Objectives:** To coordinate local responsibilities and identify options to enhance local health system capacity during a pandemic. The purpose of this paper is to illustrate the application of a Delphi exercise in an Ontario Public Health Unit as a first step in this complex planning task. Its strengths and weaknesses are presented.

**Participants:** Stakeholders representing nine categories of health care organizations.

**Setting:** Public Health facilitated the Delphi process.

**Intervention:** The exercise occurred in three rounds. In round 1, stakeholders identified a series of questions pertaining to the subject. Round 2 involved formulation of issue-related statements outlining possible strategies or solutions. Level of agreement regarding the statements by panel members were indicated. In round 3, a facilitated face-to-face meeting allowed statements to be fed back to the panel, enabling discussion of their own and other panel members' previous statement views.

**Outcomes:** Statements were formulated from questions generated by the expert panel, collated into categories and sent to all panel members. A total of 72 unique statements were developed. Agreement was obtained for 56 of the statements.

**Conclusion:** The Delphi exercise proved to be an effective approach to commence planning a coordinated local health system response to a pandemic. This process permitted advancement of the planning exercise to Phase 2 which aimed to develop operational plans for primary assessment centres, alternate care sites and hospital surge capacity.

**Key words:** Public health; health system planning; Delphi technique; pandemic; disaster planning

La traduction du résumé se trouve à la fin de l'article.

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Influenza A viruses periodically cause worldwide pandemics with high rates of illness. Advanced planning is required to optimize health care delivery.[1] An influenza pandemic will impact the health of citizens in many communities simultaneously. Local health care systems can quickly become overwhelmed. Planning and coordination in advance of the pandemic may rationalize the response and mitigate the impact of an influenza pandemic.[1]

The Ontario Health Pandemic Influenza Plan for an Influenza Pandemic states that "each Health Unit in the province will have a pandemic influenza coordinating plan that will set out the steps that local health care organizations should take to prepare for and respond to a pandemic".[2] York Region Health Services Department (YRHSD) sought to facilitate the coordination of the plan using an accelerated Delphi technique.

## BACKGROUND

### York Region

York Region covers 1,776 square kilometres with a population of 892,712 according to the 2006 Census.[3] Three hospitals with over 900 beds, 5,200 staff, 980 physicians and 29 walk-in clinics are in the regional boundaries. There are 24 long term care facilities which are comprised of private, municipal and not-for-profit homes.

### Delphi technique

The Delphi technique is a series of sequential questionnaires or 'rounds', interspersed by controlled feedback, that seek to gain the most reliable consensus of a group of experts.[4] The Delphi has been praised for its ability to find agreement among a group of experts in a particular area.[5] This technique has been used to develop plans for major burns,[6] chemical [7] and biological incidents,[8] and EMS systems in the UK.[9]

The Delphi is based on the premise that pooled intelligence enhances individual judgement and captures collective opinions of experts.[4] The main advantage of the Delphi is the achievement of consensus in a given area of uncertainty.

Due to the complexity of pandemic planning and general uncertainty around roles and expectations, the Task Group decided to use a Delphi process to identify the issues and envisage co-ordinated patient flow through the health care system.

*Assumptions*

The development of a coordinated plan is based on the assumption that each community organization and health care facility is responsible for preparing its own business continuity and influenza pandemic response plan, but certain aspects of the local health care system response require coordinated understanding, communication, resources and planning.

*Objectives*

The objectives of the Delphi exercise were to identify local roles and responsibilities and options to enhance capacity during a pan-

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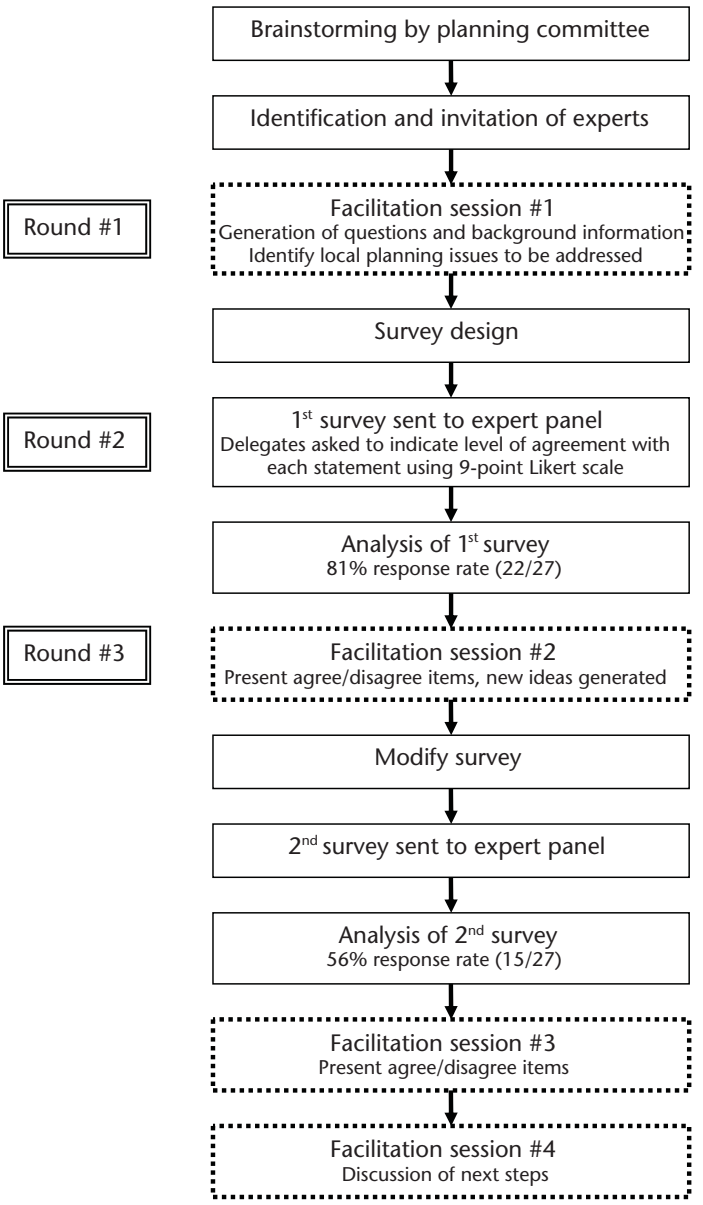
demic. The purposes of this paper are to illustrate the application of a Delphi exercise as a first step forward in this complex planning task and to discuss its strengths and weaknesses as an approach to community pandemic planning.

*Method*

A modified Delphi exercise occurs in three rounds. In round 1, a series of ideas and questions pertaining to the subject are identified by the expert panel. Round 2 involves the formulation of statements about the issue that provide possible strategies or solutions (See Appendix A). Statements are sent to all panel members and they are asked to indicate their level of agreement. In round 3, the range of agreement on each statement is fed back to the panel members through a facilitated face-to-face meeting, together with their own and the rest of the panel's previous opinions. Areas of agreement and disagreement are identified and discussed among the panel members. The panel subsequently rescore their level of agreement with the statements (see Figure 1).

**Figure 1.** Delphi Process




### Participants – Selection of the expert panel

Key organizations across the health care sector and their decision-makers were identified through an environmental scan (see Table 1).

The planning team contacted each potential participant by phone to introduce the concept of a consultative process for developing a coordinated plan and to assess receptiveness to participation. Subsequently a mailout was sent outlining the purpose, objectives and a listing of invitees. Non-respondents were telephoned again and/or sent a second mailout. A letter was sent to 63 individuals in the identified stakeholder groups. All local health care organizations were invited to send representatives. A couple of representatives from Long Term Care facilities not initially contacted approached us to participate and were included. In total, 27 individuals formed the panel and participated in the Delphi exercise.

Participants represented a diverse group of organizations (Table 1) and professionals, with job titles ranging from risk management, to infectious disease coordinators, vice presidents, managers, LTC nursing directors, and chief of staff. When the panel convened, the Delphi process was explained and the terms of reference of the Pandemic Planning Task Group were established. The terms of reference included statements on the values and ethical principles that would be applied to the evaluation of options and decision making. Participants were required to commit time for consultation with their colleagues, facilitated discussion sessions, and completion of the survey. A 3-round Delphi exercise was conducted over a 4-month period in the spring of 2006. Seventy to eighty percent of the participants attended the three facilitation sessions (17-20/27). There was consistent representation from most sectors (i.e., acute care, primary care, long term care, CCAC, EMS. St. John Ambulance, community agencies) except for pharmacies.

## OUTCOMES

A total of 72 unique statements were generated from the first Delphi discussion. Certain consistent themes arose pertaining to: triage, assessment and isolation in the community, CCAC, LTC, hospitals, EMS, alternative level of care, enhancing capacity, and occupational health.

In order to ascertain the level of consensus around each statement, the following criteria were used: 1) all members of the group agreeing with the statement; or 2) at least 80% of the group agreeing with the statement; but 3) if ≥80% were in agreement and the disagreement was from two people in the same stakeholder group, then this statement was considered to be a disagreement.

At the end of our third facilitated discussion, consensus was achieved on 78% (56/72) of the items and full discussion about the reasons for the lack of consensus on the remaining items was achieved. This process permitted advancement of the planning exercise to Phase 2. This involved the establishment of three subcommittees to develop operational plans for three key areas: primary assessment centres; alternate care sites; and hospital surge capacity, including secondary assessment clinics. Key elements of this plan include using a hub model to rationalize patient flow, developing a coordinated patient transfer plan, and taking a Region-wide inventory of the health care workforce with the cooperation of the Local Health Integration Network.

**Table 1.** Delphi Sessions – List of Invitees and Attendees

| Invitees | Attendees |
|---|---|
| Three general hospitals and one privately owned and operated hospital | Senior administrators, emergency planners and infection control officers from all three general hospitals and one privately owned and operated hospital |
| Community care access centre (CCAC) | Three senior administrators |
| Public health | AMOH and Health Emergency Planners from the Office of the local Medical Officer of Health |
| EMS | General manager and operations supervisor |
| Pharmacists | No representatives |
| 10 largest walk-in clinics in York Region and primary care physicians | Physicians from five large drop-in clinics from across the region, including those targeting our culturally diverse population |
| Long Term Care Homes | Five nursing homes representing private, charitable, municipally administered including those serving specific cultural/linguistic residents |
| St. John Ambulance | Emergency management coordinator |

**Table 2.** Results of Delphi – Examples of Statements of Agreement

- The plan should support the principle of maximizing social distancing.
- All local health care organizations and partners should develop a business continuity and pandemic response plan and understand how their plan fits into the coordinated plan.
- All members of the health care system have a vested interest in ensuring that plans for assessment and triage are adequate because "upstream" processes will impact "downstream" services and capacity.
- The capacity of the system should be enhanced through deferral of non-essential primary and acute care services.
- The plan should include establishing a few triage/assessment centres and secondary assessment clinics (to the limit of capacity).
- The plan should include establishing a few alternate level of care sites (to the limit of capacity).
- The plan should not include a dedicated influenza hospital or a dedicated long term care surge facility.
- Hospitals are responsible for planning their own "surge' sites.
- Standard criteria for diagnosing and assessing disease severity, for admission into hospitals and CCAC services, and for providing ventilator support are required.
- Health care provider capacity should be enhanced through skills development.
- Health care providers who are willing to be redeployed should be adequately rewarded and protected.
- The level of occupational health precautions should be standardized throughout the Region.

Through the iterative process of the Delphi exercise, the panel came to agreement on many of the "big picture" aspects of how patient flow might happen during a pandemic in the Region (see Table 2). Figure 2 demonstrates the patient flow model defined through the Delphi exercise and facilitated discussion. The variable size of the arrows depicts the relative volume of individuals anticipated to utilize and flow through the different facilities/agencies. The legend indicates the proposed local health care partners who have a responsibility at these sites. Existing services will continue to operate but will be enhanced by higher reliance on telephone assessments and the operation of a primary assessment centre for individuals with flu who are not ill enough to require a hospital ER visit but who, for whatever reason, are not able to see their family physician. Hospitals are responsible for planning secondary assessment centres to enhance their ER capacity for individuals seriously ill with influenza, and the alternate care site will facilitate hospital discharge and consolidate supportive services for individuals who do not require hospital services but who are not able to cope at home. Additional planning for the operation of these surge sites is underway.

## DISCUSSION

Planning a coordinated local health system response to a pandemic scenario is a complex and daunting task. The need to clarify expectations, overcome disagreement, and facilitate dialogue and consensus among diverse stakeholders is critical to successful planning. A Delphi exercise can address some of these challenges. This approach has its sceptics and critics.[10-13] The authors share some of these concerns, but overall we found the Delphi to be an efficient, effective way to identify the components of the complex problem and to facilitate dialogue and foster agreement.

### Strengths

One of the strengths of the Delphi technique was that it created a forum for open communication, collaboration, sharing of ideas and networking. It offered a neutral tool through which contentious issues could be raised and discussed, and provided a record of attendance and participation.

Second, the Delphi effectively achieved consensus among stakeholder groups. Members were able to voice their opinions and concerns which were reflected in the revised statements and brought forward to the group for agreement or disagreement.

Third, given the demands on stakeholder schedules, the Delphi allowed decisions to be made quickly through four 2-hour face-to-face meetings. The timeline can be flexible; the interval between meetings could be shortened if necessary to expedite decision-making.

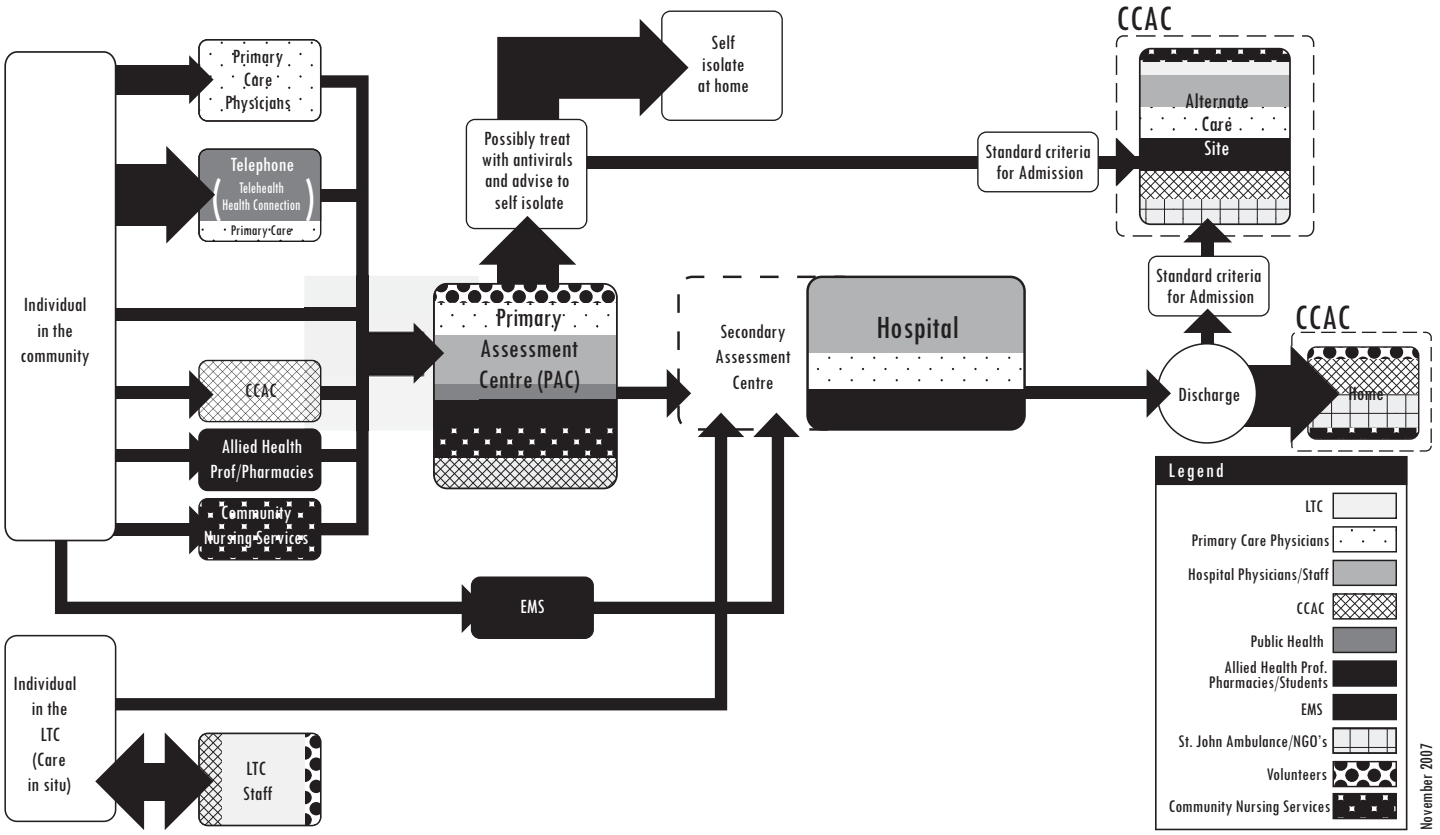
### Weaknesses

One of the weaknesses reported in the literature is that anonymous individual opinions can lead to a lack of accountability. However, we did not find this. Individuals participating were recruited on the basis of knowledge, willingness to participate,[11] and having a vested interest in developing a coordinated pandemic plan. In our experience, the discussion was open and transparent. Accountability was achieved by engaging participants in establishing the terms of reference, and requiring participants to sign the record of attendance and list themselves as authors on the Summary of Phase 1 Report.

Selecting an expert panel has been criticized as a potential for bias as the exact composition of the panel can affect results obtained.[12] However, if the panellists participating in the study can be shown to be representative of the group or area of knowledge under study, then content validity can be assumed. This can be fostered by seeking representation at the executive level.[12]

A challenge of this project has been that there was no pre-existing forum for these participants to meet. Critics have noted that it is difficult to retain high participation and response rate within a Delphi that has many rounds.[12] This could be an explanation as to why many researchers are now stopping at 2-3 rounds.[12] We found, specific to this Delphi, the participation was good but not complete. The response rate on the second iteration of the Delphi survey was 56% (Figure 1); however attendance at the subsequent forum to discuss the results of the second iteration of the survey was high. In our estimate, the thrust of the Delphi process lies in the facilitated discussion, with the survey component acting primarily as a neutral tool to support the discussion. Skilled group facilitation

**Figure 2.** Proposed Patient Flow in a Pandemic - York Region




with a consistent appeal for reasonable dialogue and an acknowledgement of uncertainties were sufficient to garner continued buy-in from the panel participants.

Because of the complexity of the task, there was potential for the panel to become sidetracked by details. The exercise worked best for the "big picture" issues. The tendency to get caught up with details presented an ongoing challenge. The quality of a Delphi rests on the strength of its design, the sample, and the process by which consensus is identified.[13]

### Logistics and resources

The Delphi exercise required a planning team of five staff with a range of skills that included survey design and analysis, knowledge of the community and key health care organizations, knowledge of the issue under discussion (pandemic influenza), and skills in group facilitation and consensus building. Care was also taken to ensure the team's credentials matched the level of the panel members in order to enhance credibility. For example, the Associate Medical Officer of Health (AMOH) and senior nurses with broad experience and credibility in the acute, community care and long term care health fields led the exercise.

Great attention was given to building cohesiveness and promoting active participation through small gestures: greeting each participant, providing name tags and information packages, and assessing satisfaction with progress in an informal manner. Light refreshments were provided for every session. The meeting took place in a neutral location with a circular seating arrangement. Meetings usually opened with introductions and a power-point presentation on progress to date. The facilitator utilized a respectful and non-judgemental approach toward all ideas, and all suggestions were duly noted. Notes were taken throughout the facilitated discussion.

Post-meeting evaluations were completed. Feedback was solicited and received on the content and format, and led to modifications of the process. The planning team met before and after each of the four meetings to summarize progress and to strategize approaches to maintain participants' engagement and move forward.

### Recommendations for the future

- Ensure the panel is composed of individuals with a similar level of decision-making authority for their respective orgnizations to allow for a free exchange of information.
- Have each representative designate an alternate to attend.
- At outset, discuss accountabilities and establish mechanisms for accountability for and dissemination of the product.

## CONCLUSION

The Delphi exercise proved to be an effective approach to accomplish the objective of Phase 1 when planning a coordinated local health system response to a pandemic. Through this exercise, the major issues were identified, familiarity with the issues were enhanced, community relationships were established and strengthened, and an agreement on "big picture" issues was accomplished. These initiatives are currently underway and represent the second phase of the complex planning exercise, successfully launched by the Delphi approach described herein.

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## Appendix A. Generation of questions

- Where will triage, isolation and care for influenza patients occur and who will do this?
- How can we estimate and increase the capacity of the local health care system?
- What are the essential and non-essential health care services during a pandemic?
- How do we ensure that only the sickest flu patients are transferred to hospital?
- How do we ensure that patients with other acute care needs continue to receive services?
- What do long-term and community residential facilities need to provide care for flu cases in their own facilities? How can EMS and community nursing services assist?
- What are the realistic limits of the local health care system and how can we agree upon and prioritize response strategies ethically?


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## RÉSUMÉ

**Objectifs :** Coordonner les responsabilités locales et répertorier les moyens possibles d'améliorer la capacité des systèmes de santé locaux lors d'une pandémie. Nous avons voulu illustrer l'application de la technique Delphi dans un bureau de santé publique de l'Ontario comme première étape de cette tâche de planification complexe. Nous présentons les forces et les faiblesses de la technique.

**Participants :** Des représentants de neuf catégories d'organismes de soins de santé.

**Lieu :** Un bureau de santé publique dont le personnel a animé l'exercice Delphi.

**Intervention :** L'exercice s'est déroulé en trois cycles. Pendant le cycle 1, les parties prenantes ont défini une série de questions sur le sujet. Pendant le cycle 2, on a formulé des énoncés liés aux enjeux pour ébaucher des stratégies ou des solutions possibles, en précisant le niveau d'accord des participants à l'égard de ces énoncés. Pendant le cycle 3, lors d'une réunion en personne animée par le bureau de santé publique, les énoncés ont été présentés de nouveau aux experts pour qu'ils en discutent ensemble.

**Résultats :** Les énoncés ont été formulés à partir des questions produites par le groupe d'experts, puis triés en catégories et envoyés aux experts. Sur les 72 énoncés élaborés, 56 ont été acceptés.

**Conclusion :** L'exercice Delphi s'est avéré un moyen efficace de commencer à planifier la riposte coordonnée d'un système de santé local dans l'éventualité d'une pandémie. Il a permis de faire progresser la planification jusqu'à la phase 2 : l'élaboration de plans opérationnels pour les centres d'évaluation primaires, les autres centres de soins et les hôpitaux aux prises avec des hausses soudaines de patients.

**Mots clés :** santé publique; planification des systèmes de santé; technique Delphi; pandémie; planification antisinistre