ORIGINAL RESEARCH

Experts' Views on the Gaps in Public Health Emergency Preparedness in Israel: A Qualitative Case Study

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ABSTRACT

Background: Despite the significant improvement in all components of preparedness in the past decade, there are still gaps between the guidelines and the reality on the ground. The purpose of this study is to explore how Israeli public health and emergency medicine experts perceive the demands for health organization emergency preparedness and the actual practice.

Methods: Qualitative phenomenological research. We interviewed 22 Israeli public health and emergency medicine experts face-to-face and conducted a content analysis.

Results: The findings revealed barriers in the following areas: preparation and readiness of hospitals, preparedness and readiness in the community, connection between the community and the hospital, inter-agency coordination and interface, interdisciplinary integration, preparedness resources, postcrisis evaluation, assimilating smart technologies, information accessibility, and communication.

Conclusions: To reduce the gap between theory and practice, retrospective research and evaluation must be included to learn in depth what strategies and resources should be used during a health crisis. Likewise, profiles should be constructed and the community should be segmented in order to design resilience programs and accommodate information to subpopulations.

Key Words: content analysis, coordination, gaps, experts' views, qualitative research, Public Health Emergency Preparedness (PHEP)

Emergencies include a wide range of events, from infectious disease outbursts through natural disasters to chemical warfare. Emergency events can have far-reaching social, economic, and political impacts. Emergency preparedness requires the investment of systemic and administrative resources and thought over time. An approach that has emerged in recent years unites different emergency events, on the assumption that effective emergency preparedness is more likely to be achieved if an all-hazards response plan is adopted.[1,2] Therefore, in 2005 the US Congress officially declared a Public Health Emergency Preparedness (PHEP) program, and, in 2006, passed the Pandemic and All-Hazards Preparedness Act (PAHPA).[3]

In 2011, with the purpose of helping health organizations around the world design strategic plans for emergency preparedness, the Center for Disease Control and Prevention (CDC) first published national standards for public health preparedness competencies.[4] The document discusses areas of public health preparedness: bio-surveillance, countermeasures and mitigation, information management, community resilience, incident management, and surge management. This document, as well as its latest update,[5] serves as a basis for strategic planning, with each area including a list of components that need to be performed to realize competencies.[3]

Emergency preparedness requires a sophisticated system that takes into account not only professional medical considerations per se but also systemic and administrative aspects of cooperation. The World Health Organization (WHO) has addressed in detail the necessary components required in emergencies: leadership, coordination, uniform language, a ready support system, economic resources, and a functioning administration.[6-8] Emergency preparedness must invest in the cooperation and coordination between parties on the national level and those on the community level: business, education, health organizations, and short and long-term medical and mental health service providers. To achieve high readiness before a crisis, it is advisable to evaluate, identify, and monitor the cooperation between the various organizations in the previous crisis. High preparedness also facilitates the community's postemergency recovery.[4,5]

A growing number of systematic reviews has been added to the literature in recent years monitoring

preparedness programs over periods of years.[3,9] These reviews have examined and mapped knowledge gaps in the area,[10] examined the extent and quality of the relationships between different preparedness bodies, and identified the main barriers that arise from the combination between them.[11-13]

One of the most important resources that can be used at the emergency preparation stage is cooperation between the different organizations. The effectiveness of cooperation between government and community parties may be the critical element for recovery at all pre- and postcrisis stages. To address the necessity of coordination between the different bodies, the WHO declared the need for a coordinator on the state level to coordinate and train local medical personnel in risk communication.[7]

The findings of the review by Khan (2015) and Savoia et al. (2017) indicate the importance of monitoring and evaluation at the planning stages. Data-driven planning activities have emerged as a new area of investigation, as have the use of evaluation activities to assess system capacities, community needs, and lessons learned from responses to emergencies. Research gaps remain across all areas, especially in the area of communication in relation to information-sharing across agencies. In addition, there is a lack of evidence across all areas on the transferability of specific interventions from system to system.[9,10]

The evaluation research literature illustrates the importance of implementation of the recommendations. For example, in 2018, the CDC published a report reviewing preparedness activities, alongside the investment on the federal, state, and local levels, with stories that illustrate the impact of those activities. The purpose of the document was to provide planning guidance and instructions to state emergency managers and shelter planners on the integration of aid into existing shelter plans to meet the needs of the general population.[14]

An example of this can be seen in the joint project of the National Implementation Research Network (NIRN) with the CDC. The NIRN is a network consisting of a multidisciplinary team with the mission of contributing to the best practices and science of implementation, organizational change, and system reinvention, to improve outcomes across the spectrum of human services. One of this network's projects is "The Perinatal/Neonatal Outreach Coordinator" that provides technical assistance with completing the CDC tool and implementing immediate postpartum, long-acting, reversible contraceptive projects within birthing facilities (https://nirn.fpg.unc.edu/).

Another example is the review by Murthy et al., 2017, considered to be the first review (from 2001 to 2016) evaluating the progress of public health emergency programs (PHEP) and checking preparedness on the government, local, and territorial levels.[3] This study was conducted among different emergency stakeholders, who were asked through questionnaires to rate their competencies in every area on a scale from "no competence" to "full competence." Analysis of the findings indicated a significant improvement in preparedness competencies in all 6 CDC areas (see above). However, the only reduction in capability was also evident in this domain with a 12% decrease in the number of jurisdictions reporting developed coordination between the health system and public health agencies.[3]

In 2007, the government of Israel decided to establish a National Emergency Authority (NEA), as a coordinating and integrating party for all of the organizations that manage the home front in emergencies. The need for a coordinating authority was one of the lessons from Israel's 2006 Lebanon war. At times of routine, the NEA is required to prepare emergency plans, instruct emergency bodies on emergency preparation, conduct exercises and training, promote international cooperation, coordinate emergency research and information, and more (http://www.mod.gov.il). In 2002 and 2015, the State Comptroller audited emergency preparedness and found serious deficiencies. The comptroller's reports found an absence of comprehensive legislation on managing the home front in emergencies. There is still a lack of clarity on the division of responsibility between the NEA, the Emergency Economy, and the Home Front Command, a lack of a dedicated budget, and a lack of an oversight mechanism to guarantee the optimal use of the budget.

The law in Israel does not specifically refer to the provision of medical services in the community in emergencies, so it is difficult to determine who is responsible for emergency medical services and to what extent. There is a shortage of physician training, medical insurance, and emergency medications. Also lacking are armored vehicles to transport medical personnel in emergencies, and a secure system to transport blood tests and laboratory samples (State Comptroller, 2015).[15]

In light of the gaps between the importance of emergency preparedness and its implementation, the purpose of this study is to explore how those gaps are perceived by public health and emergency medicine experts.

METHODS
Research Design
We conducted qualitative phenomenological research with 22 public health and emergency medicine experts, which examined their perceptions of the gaps between the demands for health organization emergency preparedness and the actual practice. Qualitative methods were chosen to conduct a deep exploration of preparedness and barriers to its realization from the perspective of the people who work in the field of emergencies.[16] In qualitative phenomenological research, the researcher is able to examine the characteristics of research populations from the perspective of individuals and reach a

deeper understanding of the phenomenon studied by analyzing the experiences of the intreviewees.[17]

The Research Population

The research used intensive sampling[18] to choose the public health and emergency medicine experts with the most knowledge and experience in their fields. The research included 22 interviews with various emergency experts (16 men, 6 women). They included public health experts, experts on health and environment, experts on medicine, an expert on emergency preparedness, an expert on math/cyber, experts on the health aspects of psychology, and an expert on risk communication and health communication.

Sampling and Research Process

After approval by the Haifa University Ethics Committee (approval no. 472/18), we approached public health and emergency medicine researchers through the National Knowledge and Research Center for Emergency Readiness at Haifa University. The interviews were 45 min long and were conducted face-to-face by 2 researchers trained in qualitative interview methods.

Research Tools

A semi-structured protocol was designed to explore the gaps between theory and practice in emergency readiness in Israel and the ways the experts think they can be mitigated, with an emphasis on future research avenues. The protocol questions were as follows: (1) What is your expertise in the context of emergency readiness? (2) What do you see as the main gaps in your field between theory and its practical implementation? (please give examples on the international level and in Israel). (3) In your field, do you see differences of discourse between the experts? (eg, epidemiologists speak a "different language" from risk professionals)? What are the challenges of discourse? (4) What do you think are the most promising directions of research in emergency readiness in your field? (please rate the top 3). (5) Are there theoretical models that have recently been developed and can be used as the basis for a model adapted to Israel?

Quality Control and Data Processing

To test research credibility, a preliminary pilot was held with 4 experts, including a review of wording and content corrections of the interview protocol. Throughout the research, all relevant information to the study was preserved, from the raw data collection, through data analysis, to the final findings and conclusions. The researchers tested the research credibility in the material analysis by comparing what was similar and different in the content analyses of the 3 researchers, and holding a discussion at the end of which the final findings were determined.[19]

Data Analysis

All collected data (interviews, recordings, lists, and notes) were transcribed. We conducted a content analysis using a qualitative analytic method for identifying, analyzing, and reporting patterns (themes) within data.[20] This method goes beyond counting phrases or words in a text, and also identifies implicit and explicit ideas within the data. The issues and questions that we searched for in the text corresponded to the research question regarding gaps between theory and preparedness guidelines and what actually happens in practice. Each interview was analyzed separately. In the next stage, 3 authors analyzed the data to identify main research categories and name the main themes. This enabled breadth comparison of the collected data, and constituted a basis for preliminary analysis of main themes and subcategories of the interviews with stakeholders. The last stage included a focused analysis of a main theme connected to all of the categories and to the research purpose of this study.[21]

RESULTS

Lack of Preparation and Readiness of Israeli Hospitals

The interviews found that, despite the guidelines for emergency preparedness, the hospitals can deal with short-term stress situations, but will be strained if they have to cope with a prolonged emergency, due to the need for the supply of medical equipment, food, medical gases, etc. The supply routes require coordination between all of the bodies, which the interviewees said is not optimal today. One interviewee noted that, in the case of a mass event with thousands of casualties, the hospitals will not withstand the stress, because they already work at full capacity in routine times. Some interviewees noted that following the 2006 Lebanon war, Rambam Hospital in Haifa built an underground hospital, but it is was not clear how the hospital would function in an emergency. The feeling was that this question is not sufficiently addressed in personnel training, and especially in the hospital's internal coordination system. In addition, despite periodic simulations, respondents claimed that these were held too infrequently and did not include all of the relevant teams (see Table 1).

Lack of Preparedness and Readiness in the Community

The interviews with the experts found gaps in readiness and preparedness in key aspects of community-level services. First, it emerged that the community does not have the fortification and professional capacity to treat patients who cannot reach hospitals in an emergency (see Table 1). This especially concerns chronic patients, such as dialysis patients. Second, the interviewees said there was insufficient training of dedicated teams of community physicians to deal with emergencies. The interviewees claimed that physicians are not trained to treat patients at home. In addition, there is also a shortage of physicians who can be consulted in an emergency

TABLE 1

Main Themes and Selected Respones	
Theme	**Selected Respones**
Lack of preparation and readiness of Israeli hospitals	"The hospitals are at 100% capacity during times of calm. There is a shortage of fortification, hospital beds (adult and pediatric ICU, burn units etc.)… Israel has five burn treatment beds and [adding beds] has been delayed for years and there is a big shortfall."
	"The current emergency scenario is that there is a fortified underground hospital that is supposed to serve a capacity of 2000 patients. The question is, what is the scenario of the hospital functioning in this situation?"
	"In any future mass-casualty event, the exposure of the population is going to be so great that the hospitals are going to collapse to the point that they will not be able to serve both their ongoing patients and the casualties. These frameworks exist, they are part of the planning, but I think the whole interface has never been tested, has not been practiced properly, and has not been conceptualized."
	"There is a need for exercises and simulations of medical teams. Many people who deal with the theory have not experienced the chaos of a multiple-casualty event that needs to be managed and organized, to respond correctly, which means better treatment and less mortality and morbidity of arriving patients."
Lack of preparedness and readiness in the community	"Most of the places in the community are not prepared to provide a solution, for instance, dialysis facilities…"
	"A shortage of community emergency teams to patrol in an emergency such as war and check who needs to be evacuated."
	"The subject of community resilience needs to be strengthened. I'm talking both about the population and about community institutions and the connection between them, and how they can all work together so that the community can deal with emergencies."
Lack of connection between the community and the hospital	"In the 2006 war people sat in shelters and needed medical care and were afraid to go out to the health fund clinics. The health bureau received phone calls from the Haifa municipality asking what about the patients in the shelters. The Health Ministry followed the procedure and approached the health funds, but they refused to go to the shelters and asked for people to come to them."
Lack of interagency coordination and interface and lack of interdisciplinary integration	"Even the ones with experience, sometimes their experience is on one or two subjects, but do they know everything? No. Managing the event overall is no less important. Some of the international medical preparation organizations have agendas of 'me, me, me, I'm the best and don't try to teach me.' You can do something about it but usually you go with the flow without asking questions and just get the job done. And the exercise might be exactly what they asked you to do, but not everyone will actively participate in the quality improvement or problem examination processes."
	"Interdisciplinary workshops with practical exercises… I think if we organize such an activity it will also attract interested people and create a common language… For instance, to take a certain emergency exercise and try to understand how it can help our functioning in emergencies in the broad sense and not only for the specific situation."
	"Sometimes different experts that come from different disciplines and represent their organizations do not speak the same (scientific) language."
	"In general, Israel is not good at coordination between bodies and government ministries and there are disagreements about powers and authorities and an inability to cooperate because everybody wants to keep it for themselves. Partly because of not wanting to share the information and partly because there is no culture of cooperation."
	"The groundwork needs to be laid to improve communication, between academe and government and civilian parties, and improve the familiarity and communication between the relevant parties." It was also suggested to conduct joint interagency simulations to promote cooperation and preparation.
Lack of resources for preparedness	"The gap between theory and implementation in Israel is the result of under-resourcing. It is necessary to allocate standard positions for this area: resources and personnel."
	"There is a difference between the ideal and reality. This job (emergency drills) has never been financially compensated."
Lack of postcrisis evaluation	"It is not only managing the event but also managing the secondary crises and the ones that come later. Learning lessons and integrating them within the evaluation stage along with the entire internal and external staff, this needs a lot of work."
Information accessibility and its communication to the public	"The information needs to be accessible to the public in all of the languages spoken in Israel (Hebrew, Arabic, English, Russian and Amharic). I think there should be a hierarchy between the scientific knowledge of those who are proficient in the field and know the professional language, and making it as accessible as possible to the general public."
	"Such studies would help reduce the existing gaps in information and risk communication by decision makers."

Abbreviations: ICU, intensive care unit.

to decide who needs to be evacuated (see Table 1). Third, most of the interviewees emphasized there are not enough programs to strengthen community resilience in preparation for emergencies. This includes advance and comprehensive emergency preparation of populations with disabilities; accommodating all programs, information, and services to chronic patients and disabled populations; and providing accessibility to information concerning preparation for stress and health situations

to specific populations and minority communities (the Arab community, immigrants, etc.) and disempowered communities (communities living in poverty, disabled populations). Furthermore, formative research has not been performed with the various populations to develop pre- and postdisaster resilience (see Table 1).

Lack of Connection Between the Community and the Hospital

The interviewees noted that there is no interface between hospitals and the community and no joint programs and simulations for these 2 systems. There are presently specific programs or simulations within the hospital system and there are general guidelines in the community, but there are no accommodated programs that interface between the community and the hospitals in aspects of medical personnel training, supplies, building a mobility apparatus between the community and the hospital, and a psychological support system for community medical teams.

One of the interviewees noted the lack of interface discovered during the 2006 war as an example that illustrates the disconnection between the community and the medical system (see Table 1).

Lack of Interagency Coordination and Interface and Lack of Interdisciplinary Integration

Some of the interviewees noted that experts sometimes think they have all of the knowledge and therefore do not engage in exchange and sharing of information or implement cooperation over time. For example, 1 interviewee said that a desire for exclusivity and centralization creates a culture of lack of cooperation (see Table 1).

The interviewees noted that sometimes there is also a problem of communication between organizations that speak different professional languages (see Table 1).

One of the proposals raised by the interviewees to tackle this problem is to create and maintain an interdisciplinary preparedness information center to create synergy between the disciplines, and expand the interdisciplinary conversation to create a better connection between academe and the field. They also argue it is necessary to improve communication between academe and government and civilian parties.

Lack of Resources for Preparedness

Some interviewees claimed that most of the energy and financial resources in health today go to resolve urgencies or crises. They claimed effective preparedness is under-resourced. There are not enough human, financial, or legal resources to create preparedness infrastructures (see Table 1). Moreover, 1 of the interviewees noted that the person in the organization in charge of emergency preparedness is usually not compensated for this responsibility, and this influences the

prioritization of preparedness within the organization itself (see Table 1).

Lack of Postcrisis Evaluation

Most of the interviewees claimed that, after health or national crises such as war, which have health consequences, there are insufficient evaluation studies to learn lessons. The simulations that occur are usually based on models from the literature rather than being based on what actually happened and involving the stakeholders (see Table 1).

Assimilating Smart Technologies

Monitoring systems and smart technologies to address health crises and urgent medicine exist. These include information technologies and social networks; systems that provide the hospital with a full picture of the situation and number of casualties in practice in real time; use of social networks for real-time data collection, casualty location, access to the site, and so on. However, the interviewees noted that the existing technological measures are not sufficiently assimilated in practice. There is also still a shortage of technological systems to improve control and orientation in emergencies in the hospital when hundreds of casualties arrive.

Information Accessibility and Communication

The interviewees noted that not enough work is being done in the area of communication to make information accessible to the public and accommodated to different populations. Today there are challenges that have not yet been addressed, such as: how to make preparedness accessible to the public without being threatening? How to build systems that use the social networks to address the public's concerns and questions during crises? Furthermore, the interviewees noted that studies need to be made to characterize and profile-sensitive populations, such as the elderly, chronic patients, people of low socioeconomic status, and so on, to make the relevant information accessible to them. For example, the technology exists to profile populations at risk from heat waves, such as the elderly, and target them with pertinent warnings. Nor are sufficient studies and experiments conducted with representatives of different audiences to examine how they want or are willing to receive information from decision-makers (see Table 1).

DISCUSSION

The study findings indicate a gap between the existing knowledge on preparedness and the situation in practice, and reveal lacks in the areas of: preperation in hospitals and community and the connection between the 2, coordination and interdisciplinary integraion, resources, postcrisis evaluation, smart technologies, information accessibility, and communication.

The first issue that the findings indicate is a number of blind spots within the health organizations themselves. The hospitals have preparedness plans and conduct simulations, but

these are still partial and cannot simulate real-time stress situations, nor do they fully and effectively involve all of the stakeholders. Furthermore, the study found blind spots within the community system. It found that the community does not have the hardware and professional capacity to serve patients in an emergency. Likewise, there is a shortage of training of dedicated teams of community physicians to deal with emergencies. Nor are there enough programs to strengthen community resilience in preparation for emergencies.

The second main finding of the study was the absence of interface between the community and the medical system. In a congressional testimony, the administrator of the US Federal Emergency Management Agency (FEMA), Craig Fugate, described and explained the gap and disconnect between the medical and community systems.

"Government can and will continue to serve disaster survivors. However, we fully recognize that a government-centric approach to disaster management will not be enough to meet the challenges posed by a catastrophic incident. That is why we must fully engage our entire societal capacity…"[22]

To reduce this gap, FEMA decided to implement the whole community approach to emergency management. This included understanding and meeting the actual needs of the whole community, engaging and empowering all parts of the community, and strengthening what works well in communities on a daily basis. The principles and guidelines of the community approach to emergency management are recognized by international organizations whose goal is to improve the response to emergencies, protecting citizens from a wide range of threats, particularly future pandemics and crossborder threats to health.[23-25] However, as this study and 1 by Ramsbottom et al. (2018) found, despite the efforts of the international organizations, there is still a gap between evidence and practice in terms of synergies between communities and institutions and how institutions can engage communities.[11]

The third major issue this study indicates is that the disconnects between the different medical systems are largely the result of lack of cooperation and integration between the different disciplines. Although Israel is experienced with emergencies that have far-reaching consequences for the physical and emotional health of its citizens, cooperation and integration between its different agencies is still inefficient.[15] Some of the interviewees emphasized the absence of a norm and culture of cooperation in Israel. Some emphasized the gap between the organizations that represent different disciplines and different "languages," which makes it difficult for them to communicate. Toner et al. (2015) also found that the factors that impede cooperation and emergency preparedness include differences in norms of behavior and terminology between the different disciplines.[12] Furthermore, issues of hierarchy between different agencies create feelings of frustration, misunderstanding, and mistrust.

Toner et al. (2015) also found a vagueness in job definition and areas of responsibility of different agencies.[12] Studies in Israel such as on the 2009 H1N1 influenza outbreak found that the implementation of international organizations' guidelines was partial and inefficient because the health system did not succeed in involving and including the different stakeholders and accommodating the guidelines to the cultural and community basis in Israel (Gesser-Edelsburg et al., 2015).[26]

The absence of effective cooperation over the years is also a consequence of the absence of evaluative research on aspects of cooperation, such as a lack of criteria for the success of corporation on the local and national level,[12] as well as other aspects of preparedness, as this research also found. Formative evaluation of emergency preparedness programs is critical for processes of learning and improvement in anticipation of urgent medical crises.[9] Evaluation research repeatedly finds that many health-promoting programs make limited use of accumulated knowledge. There is insufficient lesson-learning to improve future interventions and inadequate implementation of existing knowledge resources. In many cases, projects that do not take the necessary actions to accommodate to the target populations succeed only partially while wasting precious resources. In recent years, there has been an emphasis on the importance of performing evaluative research to assess the success of intervention programs.[27] Without thorough and systematic evaluation research, it is difficult to measure the success of interventions, the contribution of the theoretical model on which they are based, and to what extent the goals set and results obtained justify the efforts and resources invested in the program.[28] The products of the evaluation can provide scientific proof of the success or failure of the intervention, and the understanding of its strengths and weaknesses.[27] Evaluation studies can create a knowledge base that will enable the developers of intervention programs to improve existing programs and develop future programs.[29]

Furthermore, funding bodies wish to know whether their financial investment in the program yielded the desired results.[29] Some of the leading evaluation researchers in the field of intervention programs emphasize the importance of a comprehensive approach that examines and analyzes both the goals and models of intervention, uses diverse research methods, and includes the target audiences of intervention programs in establishing the parameters for evaluation, even before the evaluation begins (Guba and Lincoln, 1989).[30] Formative evaluation[31] entails not only evaluating the contents of the preparedness but also building public profiles through qualitative and quantitative studies pinpointing different subpopulations and identifying different trends in public discourse, or the public sphere.

A key finding of this study is that currently there is insufficient mapping of the profiles of different at-risk subpopulations in order to communicate accommodated information to them during health crises. The public is conceptualized in different

ways, and it would be a mistake to approach it as though it were a monolithic entity.[32] Transnational public health organizations, such as the WHO, emphasize the need to characterize what is meant by the public in order to reach it.[33] On a conceptual level, this can be achieved through segmentation: identifying subgroups within a population according to relevant characteristics, not necessarily according to conventional sociodemographics.[34] For example, subgroups may be identified according to attitudes or practices directly related to preparedness. Segmentation facilitates more effective communication tailored to the needs of specific audiences, so that risk perceptions are clarified and response improved. It is crucial to build specific high-resolution profiles that take into account many different variables, including language, age, gender, culture, religion, level of education, work/profession, perceptions, etc.[35]

Indeed, international health authorities have addressed the subject of segmentation in their outbreak communication guidelines and reports.[36] For example, the 2008 edition of the *World Health Organization Outbreak Communication Planning Guide* stressed the need to "conduct an assessment of existing public communication capacity and existing research of community understanding, including demographics, literacy levels, language spoken as well as socio-economic and cultural backgrounds."[6] The CDC's *Crisis and Emergency Risk Communication: Pandemic Influenza* recognized that "nonetheless, one size fits all never fits all people equally well."[37]

However, despite the theoretical foundation and understanding exemplified in these guidelines and reports, this understanding is not translated into practical "how to" recommendations at the local level, ie, how exactly national health authorities should build segmented profiles of their various publics.[36] In the present age of the new media and its social sphere, the organizations cannot communicate messages "top to bottom" without including the citizens in the planning and evaluation process.[35] The new media have become an important source of health information and a platform for discussing personal experiences, opinions, and concerns regarding illnesses and treatments, and have contributed to the shift in the role of the public from recipients to an active and vocal entity.[35] The preparedness stage is a critical stage in which the organizations need to take into account the public's needs and tendencies and use them as a basis for the design of programs that include them and help them conduct themselves during crises.

The *research limitations* are that this is a qualitative study done with experts with certain characteristics (most of the experts came from emergency medicine backgrounds). Follow-up studies should expand the sample and interview health communication and organizational psychology experts. Furthermore, the study provides a generic mapping of the existing gaps in the public's preparedness and not specifically in the context of emergencies with specifically health-related

FIGURE 1

Public Health Preparedness Framework.
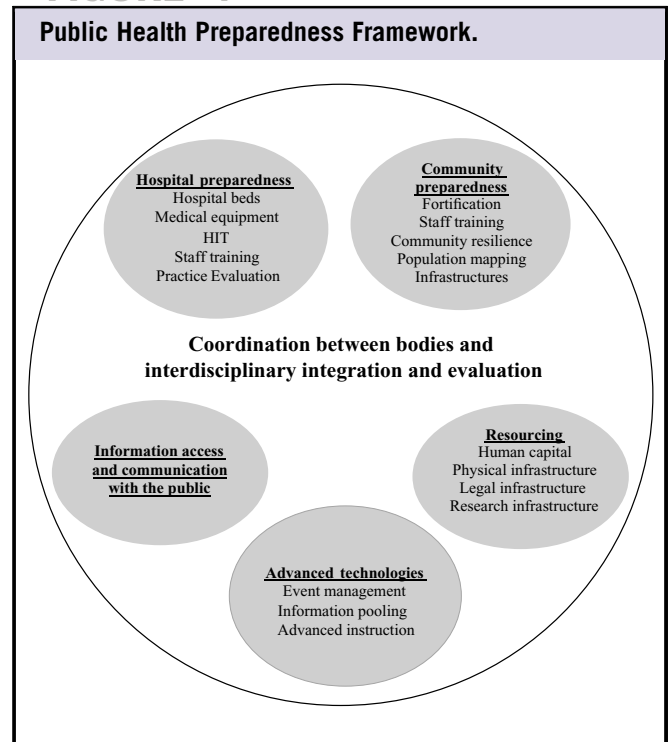
features. Follow-up studies should look at specific case studies to characterize the existing gaps on the issues of preparedness and urgent medicine.

RECOMMENDATIONS AND CONCLUSIONS

To mitigate the gaps that arise from this study, it is necessary to strengthen the preparedness of every 1 of the existing organizations by dedicating resources to evaluation. It is also necessary to strengthen the overall coordination and cooperation between different agencies that deal with emergencies by creating work procedures and ongoing periodic meetings between representatives of different agencies, not only during crises. Furthermore, in order to reduce the gap between theory and practice, retrospective research and evaluation must be included in order to learn in depth what strategies and resources should be used during a health crisis. Likewise, profiles should be constructed and the community should be segmented to design resilience programs and accommodate information to subpopulations.

It is noteworthy that systematic segmentation based on demography is limited; therefore, we recommend taking into account recently developed strategies that focus on *individual-level data*, matching it to rich statistical profiles that cross-link profiles and build new combinations of groups. Moreover, preparedness should be conducted both on the community level, as part of an ethnographical effort to build profiles, and on an aggregative level, as part of discourse surveillance. The assimilation of technological information systems and the use of social networks by professionals and the public can

contribute to laying the groundwork for developing a diverse toolset for different situations, based on the collective knowledge of stakeholders (see Figure 1).

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