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ORIGINAL ARTICLE

Experience in training in emergencies, División de Proyectos Especiales en Salud, Instituto Mexicano del Seguro Social[☆]



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Abstract

Background: There has been interest in the División de Proyectos Especiales en Salud to offer the Instituto Mexicano del Seguro Social personnel resources for training and quality thereby respond to potential contingencies. Presented here is their experience in this field.

Objective: To describe and analyse the productivity in different training programmes in emergencies and disasters developed by the División de Proyectos Especiales en Salud, Instituto Mexicano del Seguro Social.

Material and methods: Observational study in which different training activities conducted by the División de Proyectos Especiales en Salud between 1989 and 2014 are described. Descriptive statistics were used.

Results: In these 25 years have trained 20,674 participants; 19,451 IMSS and 1223 other health institutions. The most productive courses were life support (BLS/ACLS) (47.17%), distance courses «Hospital medical evacuation plans and units» (14.17%), the workshop-run «Evacuation of hospital units with an emphasis on critical areas» (5.93%) and course «Programme Evaluators of Hospital Insurance» (8.43%).

Conclusions: Although the División de Proyectos Especiales en Salud has primarily operational functions, it nevertheless has neglected its responsibility to maintain constantly trained and updated institute staff that every day is in a position to face any type of emergency and disaster.

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PALABRAS CLAVE

Capacitación;
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Desastres

This increases the chance that the answer to any contingency is more organised and of higher quality, always to the benefit of the population.

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Experiencia en capacitación en emergencias de la División de Proyectos Especiales en Salud, Instituto Mexicano del Seguro Social

Resumen

Antecedentes: Ha sido del interés de la División de Proyectos Especiales en Salud el ofrecer al personal del Instituto Mexicano del Seguro Social (IMSS) recursos para capacitarse y responder con calidad ante las potenciales contingencias.

Objetivo: Describir y analizar la productividad en los diferentes programas de capacitación en emergencias y desastres que desarrolla la División de Proyectos Especiales en Salud del IMSS.

Material y métodos: Estudio observacional en el que se describen las diferentes actividades de capacitación desarrolladas por la División de Proyectos Especiales en Salud, entre 1989 y 2014. Se empleó estadística descriptiva.

Resultados: En estos 25 años se han capacitado 20,674 participantes; 19,451 del IMSS y 1223 de otras instituciones de salud. Los cursos más productivos fueron: los de soporte de vida (BLS/ACLS) (47.17%), los cursos a distancia «Planes hospitalarios y evacuación de unidades médicas» (14.17%), el taller-simulacro «Evacuación de unidades hospitalarias con énfasis en áreas críticas» (5.93%) y los cursos de «Evaluadores del Programa Hospital Seguro» (8.43%).

Conclusiones: Aunque la División de Proyectos Especiales en Salud tiene funciones primordialmente operativas, no por ello ha dejado de lado su responsabilidad de mantener constantemente preparado y actualizado al personal del instituto, que día a día se encuentra en posibilidades de enfrentarse a cualquier tipo de emergencia y desastre. Con ello se incrementa la posibilidad de que, ante cualquier contingencia, la respuesta sea más organizada y de calidad, siempre en beneficio de la población.

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Background

Hospitals are complex, fragile structures in the presence of any type of natural or anthropogenic disaster (flood, earthquake, wars, etc.); no country can allow itself to cease to function when faced with multiple casualties.

It is vital that all governments ensure that their country's health institutions have skilled personnel, plans and programmes which enable them to adequately confront the potential impact of a disaster (earthquake, hurricane, violence, etc.) and to continue to function in a coordinated and organised manner during these times of crisis, when they are most needed.¹

In the last 2 decades the number of recorded disasters has doubled, from approximately 200 to 400 a year. It is a fact that the majority of disasters cannot be avoided, and it is also a fact that being prepared for any disaster is the best way of confronting it and limiting its impact. Within the UN National Assembly World Conference on Natural Disaster Reduction (A/RES/60/195), which was the culmination of a process which started in 1990 with the declaration of the International Decade for the Reduction of Natural Disasters (IDRND) (A/RES/42/169), the Hyogo Framework for Action was adopted in 2005 for 2005–2015; in which the 168 signatory countries agreed to achieve “the substantial reduction

of disaster losses, in lives and in the social, economic and environmental assets of communities and countries”. To that end they agreed to apply three strategic objectives: the integration of disaster risk reduction into sustainable development policies and planning; creating and strengthening institutions, mechanisms and capacities which can contribute towards increasing resilience against hazards and the systematic incorporation of risk reduction approaches into the implementation of preparedness, response and recovery programmes for emergency situations. Five specific action priorities were outlined to achieve these objectives²: (1) ensure that disaster risk reduction is a priority; (2) improve information on the risk and enhance early warning; (3) build a culture of safety and resilience; (4) reduce the risk factors in key sectors and (5) strengthen preparedness for response.

Priority 5 highlights the need to strengthen preparedness in order to achieve an effective response at all levels; given that there are studies in various countries documenting that hospital units tend not to be prepared to respond to mass casualty or disaster-related incidents, due to a lack of knowledge, few disaster plans and limited resources. Similarly, these studies show that faced with such an event, the general response gives the impression that there is a lack of coordination, and even confusion amongst individuals and organisations.^{3–11}

It is also acknowledged that, irrespective of its level of development, there is no society that can be totally prepared to respond to a major disaster and that generally there is some degree of confusion, the only way to limit this and increase capacity for response is to provide increased training for its responders.¹²

Of all the interacting elements in the operation of a hospital in the event of a disaster, the administrative and organisational aspects are vitally important in order to incorporate prevention, response and mitigation measures towards ensuring continuity of operations. To that end, personnel must be trained to provide a quality response to the situation. The challenge for education and training is to overcome the emphasis on preparation in order to act in times of emergency, and move towards promoting more integral educational activities that cover prevention, mitigation, reconstruction and rehabilitation.¹³

In reality, at the time of a disaster, all the personnel of a medical or care unit should be prepared to act in conditions outside the routine setting of their professional activity, however, current evidence shows that the preparation of healthcare staff for disasters is limited and that there is little information on the real effectiveness of the available training methods.^{14–16} In this sense, all health system professionals should receive sufficient, adapted training, which enables them to act effectively in the event of a disaster. Disaster assistance training should be treated as education. Some of the of its distinguishing features include acting in unfamiliar settings, sectorising scenarios, integrating work teams with non-health care staff from the security and rescue services, step-by-step responses, and the selection of patients according to probability of survival, amongst others.¹⁷

The Instituto Mexicano del Seguro Social (IMSS) is the major healthcare provider of the Federal Government of Mexico and, 72 years after it was created, ensures the health and social security of the 58 million people entitled to its services, and 12 million beneficiaries of the *IMSS-Prospera* programme¹⁸.

Part of the remit of Medical Care Management, through their División de Proyectos Especiales en Salud is to coordinate the *institutional plan for emergency and disaster assistance*. The plan outlines the different actions and resources on a strategic, tactical and operational level to predict and respond effectively to an emergency or disaster, communicating and coordinating at all times with the sectoral and federal authorities.¹⁹ The different training programmes form an important part of this plan. In order to realise this objective, for many years the División de Proyectos Especiales en Salud have been implementing a series of training activities, which offer healthcare staff training in order to respond effectively to any contingency or disaster. The various projects include training on basic life support and advanced cardiovascular life support, workshops on the evacuation of hospital units, the critical areas in particular, online courses on hospital plans, brigades or safe hospital courses, amongst others.

Material and methods

Observational, descriptive study to analyse the different emergency and disaster training activities, implemented by

Table 1 Training activities undertaken by the División de Proyectos Especiales en Salud (1989–2014).

Resource	Year started
<i>ATLS course</i>	1989
<i>BLS and ACLS courses</i>	2003
<i>Safe Hospital Programme Evaluator's course</i>	2007
<i>Distance-learning courses:</i>	
Hospital medical evacuation plans and units VEDOC	2011
<i>Classroom course: Healthcare personnel faced with CBRN emergency and disaster situations</i>	2012
<i>Drill-workshop: Evacuation of hospital units with emphasis on critical areas</i>	2012

ACLS: advanced cardiovascular life support; ATLS: advanced trauma life support; BLS: basic life support; VEDOC: virtual emergency and disaster operations centre; CBRN: chemical, biological, radiological and nuclear.

the División de Proyectos Especiales en Salud, Medical Care Management, of the IMSS, from 1 January 1989 to 31 December 2014.

The different training activities are shown in chronological order in [Table 1](#).

Descriptive statistics were used to analyse the information.

Results

In the period studied a total of 20,674 participants received training via the different courses of the División de Proyectos Especiales en Salud: 19,451 of the IMSS and 1223 of other health institutions; the distribution by activity type is described below.

“Advanced trauma life support” course

This activity covers programming, administering, performing the logistics required and delivering the “advanced trauma life support” (ATLS) courses in the institute, in line with current legislation.

These courses started in 1989 and the first trainees qualified in 1990. From 1990 to 2014 a total of 201 ATLS courses have been delivered with an average of 8.04 per year; a total of 3015 of the institute's doctors have received training, with an average of 15 students per course ([Fig. 1](#)).

The years in which the most courses were given were 1993 (19) and 2006 (18), and the fewest were given in 1996 (0) and 1998 (1).

Basic and advanced life support courses

The IMSS has been recognised by the American Heart Association as an international training centre, with the capacity since 2003 to issue *provider and instructor* credentials to those who satisfactorily fulfil the requirements. In this period it has trained 9728 students, with a mean of 884 per

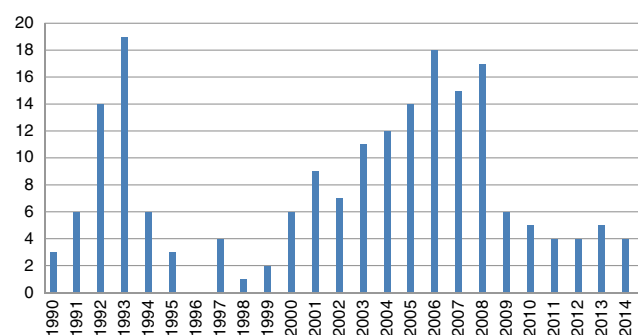


Figure 1 Distribution per year of the ATLS courses undertaken in the Instituto Mexicano del Seguro Social (1990–2014). ATLS: advanced trauma life support. IMSS: Mexican Social Security Institute.

year. ACLS (Advanced Cardiovascular Life Support) training was given to 52.51% of the participants; 995 providers and 99 instructors were trained. One thousand, six hundred and fifty one providers and 16 instructors received training on BLS, basic life support (Table 2).

“Safe hospital programme evaluators” course

The “safe hospital programme evaluator” course started in August 2007. It is given via the internet and comprises 33 subject areas delivered over 60 teaching hours. This is a course for interinstitutional staff and, to date, 21 training periods have been delivered with 7474 participants registered, of whom 1792 (23.97%) have passed the course; 567 of whom (30.19%) were IMSS personnel (Table 3).

Distance-learning courses

The content of the different distance-learning courses was developed in 2011 in collaboration with the Educational Innovation Division of Health Education Coordination, which were delivered on line via the Moodle learning platform for institutions.²⁰ These courses are:

Hospital medical evacuation plans and units

These courses are designed in modular form and are aimed at the 5 hospital brigades (evacuation, basic life support, fire control and fire fighting, fluid, energy and safety control) and government body and hospital employees. The duration of the course is 20 teaching hours for participating government hospital employees and 5 teaching hours for the different brigades.

In these 4 years a total of 2922 institute workers have received training, the majority of the participants were managers (26.4%) and from the evacuation brigade (16.22%) (Table 4).

The greatest numbers of workers were trained in 2013 (39.78%).

Virtual Emergency and Disaster Operations Centre

The Virtual Emergency and Disaster Operations Centre is a computer programme²¹ which enables direct communication in real time from areas affected by a crisis, emergency or disaster up to management levels, forming a communication

Table 2 Distribution per year of basic life and advanced life support courses undertaken by the Mexican Social Security Institute, 2003–2014.

Courses/year	2003/ 2004	2004/ 2005	2005/ 2006	2006/ 2007	2007/ 2008	2008/ 2009	2009/ 2010	2010/ 2011	2011/ 2012	2012/ 2013	2013/ 2014	Total
Basic life support (BLS)												
New basic life support instructors (BLS)	177	381			287	6	2	1		7		16
BLS (healthcare providers)	283	512			200			400		544		1789
ACLS provider						399	300	315				995
Healthcare provider students			357								280	1651
New ACLS instructors			48	8	4	18	2	2	3	13	1	99
ACLS students			548	586	586	629	480	500	550	681	550	5110
DEA heart-saving students				48								48
Heart-saving instructors										20		20
Final total	460	893	953	642	1077	1052	784	1218	553	1265	831	9728

ACLS: advanced cardiovascular life support; ATLS: advanced trauma life support; BLS: basic life support; CBRN: chemical, biological, radiological and nuclear.

Table 3 Distribution per year, courses delivered and students of the safe hospital programme evaluator course (2007–2014).

Year	Courses delivered	Personnel trained
2007	2	57
2008	4	185
2009	3	193
2010	1	58
2011	3	499
2012	3	369
2013	2	163
2014	3	268
Total	21	1792

and coordination line on a local, state and national level to assist rapid, organised and coordinated response to situations which endanger people's lives, social infrastructure or which affect the institutions' continuity of operations.²⁰ In this regard, it is a major resource for institutional response to any contingency or disaster, which makes it essential that those running the country are aware of how to manage it.

This course covers the resources which manage the system itself and is delivered in 2 versions (2011 and 2012) via an online course of 140 teaching hours, and has trained 1958 participants from all over the country.

Classroom course "Healthcare personnel faced with situations of chemical, biological, radiological and nuclear emergency"

The two-day classroom course was developed to deliver the practical and theoretical elements for implementing actions to prevent, prepare and respond to chemical, biological, radiological and nuclear (CBRN) emergencies. This course was given over the 29th and 30th September 2012, and a total of 37 participants received training.

Drill workshop "Evacuation of hospital units with an emphasis on critical areas"

These workshops started in 2012 and involved the 15 delegations of the IMSS considered at greatest risk of suffering

some type of disaster and who are covered under the Federal Earthquake Plan, which corresponds to 41.56% of all the country's delegations. During the 2 first years, 7 of these delegations were visited on repeated occasions to cover the delegations in their entirety (Fig. 2).

Although only 5 delegations participated, throughout 2014, 70 medical units participated, exceeding the total of the 2 previous years (Table 5).

In the 3 years that this programme has been running, a total of 1222 staff from the 136 medical units has been trained. 2012 was the year in which most personnel received training at 39.11%.

In general, more operational personnel participated (doctors, nurses, medical assistants, technicians, secretaries, brigade members, etc.), at 59.73%, although this trend has been changing as time passes: in 2014, 55.99% of the participants were management level (directors, sub-directors, administrative personnel, department heads). It is worthy of note that more internship personnel took part in the first years of the workshop (nursing and medicine interns, undergraduate interns and residents in the different specialities).

Discussion

The fundamental objective of all training is to offer tools which can be applied to the reality of the people receiving the training. The training activities developed by the División de Proyectos Especiales en Salud enabled areas of opportunity to be pinpointed and the capacity of personnel to be improved to respond to the perturbing phenomena to which they are exposed (earthquakes, fire, explosions, floods, amongst others).

In principle, the training activities focused exclusively on the initial care aspects of patients with cardiovascular (ACLS) or traumatic (ATLS) emergencies, but as the years passed participation started to increase in the preventive and emergency and disaster response aspects (hospital plans, brigades, Safe Hospital Programme, etc.).

The training covered diverse topics relating to emergency and disaster preparation and response. These topics were

Table 4 Distribution per year and profile of the distance-learning course participants "hospital medical evacuation plans and units" 2011–2014.

Profile	Teaching hours	2011	2012	2013	2014	Total	%
<i>Hospital plans and evacuation of medical units</i>							
Managers	24	240		401	123	764	26.14
Evacuation brigade	12	128		99	247	474	16.22
Basic life support brigade	12	167		102	195	464	15.97
Safety brigade	24	64		49	159	272	9.37
Medical and nursing staff	9		30	204		243	8.31
Fire-fighting and control brigade	12	91		60		151	5.15
Administrative personnel	10		75	52		137	4.69
Conservation personnel	15		55	50		120	4.17
Fluid control brigade	12	59		25		84	2.87
Maintenance personnel	10		48	49		107	3.65
Social work personnel	8		47	51		106	3.63
Total	148	749	255	1142	724	2922	100.00

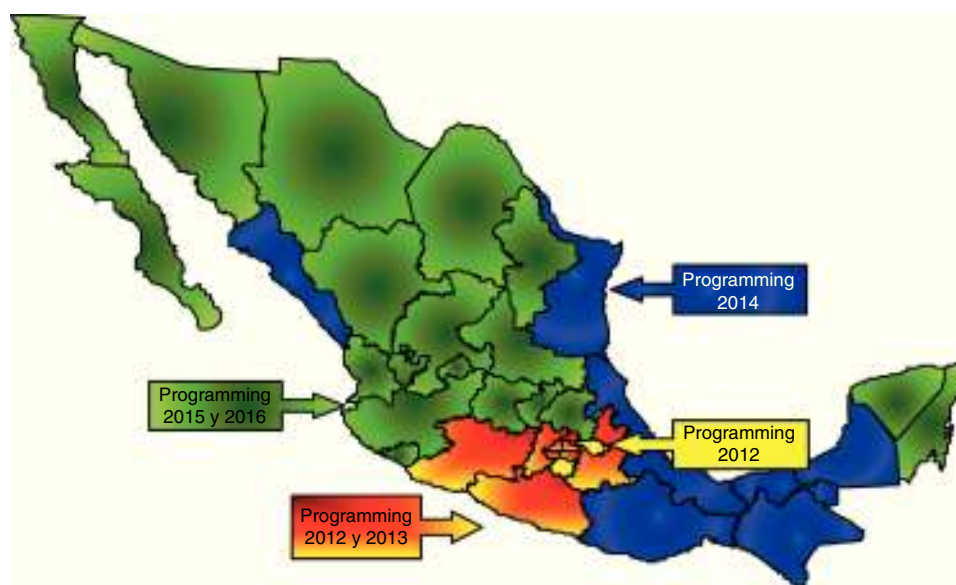


Figure 2 Programming per year of the delegations trained in the evacuation of hospital units with emphasis on critical areas.

Table 5 Distribution per year, delegation, units and trained personnel in "evacuation of hospital units with emphasis on critical areas".

Year	Participating delegations	Trained personnel				Total (%)
		Trained units	Managers	Operational	Interns	
2012	9	34	59	325	94	478 (39.11)
2013	7 ^a	32	41	240	29	310 (25.36)
2014	5	70	243	165	26	434 (35.51)
Total (%)	15 ^b	136	343 (28.76)	730 (59.73)	149 (12.19)	1222

^a In 2013 units were completed in 7 of the delegations trained in 2012.

^b Total delegations with trained medical units.

covered with a wide range of resources, in the classroom (lectures, workshops, etc.) and used the most recent information and communication technologies to suit the needs, interests and possibilities of the workers and medical units.

There were three different stages within the institute in the advanced trauma life support courses (ATLS):

1989–1995: when an average of 20 courses were delivered per year. At that time, the then Deputy Medical Directorate awarded grants to trainees and paid all of the expenses generated.

1996–2004: when the course frequency was reduced to 3–4 per year. This was because the budget was redistributed.

2005 to date: when the courses come under current administrative legislation and the training budget provided by the Quality Control, Training and Gender Division, based on training needs, with an average of 6 courses per year.

The Institute's objective for 2015 is to develop 2 courses to train new instructors, and have established actions to do so with the American College of Surgeons, Mexican Chapter. Likewise, 5 programmes have been scheduled for providers in different areas of the country.

The basic and advanced cardiovascular life support courses form part of the requirements of the General Health

Council, which is a hospital unit certifying body. Mandatory requirement SQE.8.1 (to check that medical and nursing staff, working in critical hospital areas "can demonstrate that they are able to perform basic and advanced high quality cardiopulmonary resuscitation, 24 hours a day"), designed to increase the ability of health personnel to respond to cardiopulmonary emergencies. Although it is true that infinite factors affecting patient survival can come into play in a disaster situation, having personnel who are trained to respond in such situations will have a positive impact.

The Safe Hospital Programme is linked to a commitment that Mexico made with the United Nations and the Pan-American Health Organisation, to draw up a risk reduction policy, prioritising the structural safety of hospitals, to implement reinforcement and construction measures under established regulations; non-structural safety measures including operational plans especially for hospitals located in high risk areas and safety measures based on functional organisation to enable the continuity of the hospitals' operations. The Evaluator Programme training arose from the World Conference on the Reduction of Natural Disasters in Kobe (Japan) in 2005, in which 168 countries, including Mexico, signed a commitment to develop strategies between 2005 and 2015 to increase safety in hospital

buildings by reviewing and improving their structure and to implement plans and programmes for care in disaster situations.

The online training programme arose from the need to implement the new information technologies towards designing a "Safe Hospital" model; this was carried out by a group of international disaster experts. The aim of this project is to guarantee not only that hospital facilities remain standing but that they also continue to work in an uninterrupted fashion. The Safe Hospital Programme includes ordered systems of standards and procedures comprising evaluation, diagnosis and certification to evaluate the functional organisation of the unit, and the extent to which the "Hospital plan for emergency and disaster care" is being implemented. In order to pass the course it is essential, once the online part has been passed, to complete 2 practical sessions for hospital assessment in institutions other than that of the secondment, in order to intensify knowledge in the field. The person undertaking the course is also accredited as an evaluator.

Within the same area and with a view to providing IMSS healthcare personnel tools to ensure that hospital facilities continue to work effectively and without interruption in a disaster situation, with the possibility of increasing their care capacity, promoting optimal use of existing resources while being able to rely on perfectly trained staff to provide efficient, friendly and fair support to those affected by the disaster, the División de Proyectos Especiales en Salud, in collaboration with the Educational Innovation Division of Health Education Coordination developed the distance-learning course "Hospital medical evacuation plans and units", a major contribution with the support of the institutional distance learning programme.

The course on the Virtual Emergency and Disaster Operations Centre deserves special mention; this programme consolidates the different modules describing the elements of institutional activity to deal with emergencies and disasters, which include the operational, delegation and central levels, enabling communication in real time via the internet, with the rapid and efficient creation of emergency operation centres. Few resources are required for this course; only access to the internet is needed, thus making it highly flexible and co-ordinated.

These courses were aimed at management personnel, in charge of receiving, analysing and processing information in relation to crises, emergencies or disasters arising in any operational unit of the IMSS so that, based on this information, they are able to coordinate actions and decision-making towards a rapid, efficient response appropriate to every situation, to keep the number of victims to a minimum, reduce costs and bring normality back to the unit.

A two-day classroom course was developed to provide theoretical and practical elements to implement actions prevent, prepare for and respond to chemical, biological, radiological and nuclear emergencies and disasters. Various experts participated in these courses from institutions specialising in such events, such as the Pan-American Health Organisation/World Health Organisation, The Federal Investigation Office, *Centro Hospitalario del Estado Mayor Presidencial*, the National Investigation and Security Centre, the National Epidemiological Diagnosis and Reference

Institute, the National Commission for Nuclear Security and Safeguards and the IMSS itself.

The course programme comprised theoretical sessions and skill stations for practice in techniques for putting on and taking off protection suits, and a decontamination simulation and on the initial management of exposed patients.

Considering that although total hospital evacuation is unlikely, partial evacuations are possible into the so-called critical areas (emergencies, intensive care, operating theatre, etc.), which require special care due to features of severity and the difficulties in mobilising their patients.

In the drill workshop on "evacuation of hospital units with an emphasis on critical areas" the main hospitals of the institute's various delegations focus on the government body, and emergency committee members and the different brigades of the area units. The activities are undertaken over 2 six-hour days. The first day covers the Safe Hospital Programme, hospital planning in response to emergencies and disasters, the virtual emergency and disaster operations centre, simulation and drill exercises, evacuation of medical units, and general aspects of the brigades. The second day covers training the various brigades in protocols and specific actions with individual and team practice sessions, culminating in a hospital evacuation drill with emphasis on critical areas. At the end of the course the participants have to replicate the drill workshop with the staff of each participant's unit.

For the first 3 years, workshops were scheduled in the states of the Mexican Republic at greatest risk of suffering a disaster, according to the Federal Earthquake Plan.

Although the functions of the División de Proyectos Especiales en Salud are essentially operational, it has not lost sight of its responsibility to keep the institute's staff – who could face an emergency or disaster on a daily basis – constantly prepared and updated. In doing so, the likelihood is increased that the response to any contingency will be more organised and effective to the benefit of the population.

At this time all the training activities designed by the División of Special Projects in Health are going through a process of engineering in order not only to update their subjects and content based on national and international policy but also to optimise how implementation training is given. The benefits of the information and communication technologies are being considered in order to increase the amount of participants and enable them to adapt the activities to their own time, needs and characteristics.

Similarly the participation of the institutions with the different national organisations has increased (Secretariat of Health, National Coordination of Civil Protection, Mexican Academy of Surgery, etc.), as well as that of the international organisations (World Health Organisation, Pan-American Health Organisation, World Association of Disaster and Emergency Medicine, etc.), in the different planning, legislative and implementation aspects of actions aimed at risk reduction and optimising response to different contingencies. All of this will doubtless be reflected in the actions for 2016.

Conflict of interests

The authors have no conflict of interest to declare.

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