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EPIDEMIOLOGICAL INFORMATION

## Mass-gathering medical strategies: The experience in the International Book Fair in Guadalajara

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### Abstract

**Introduction:** The Guadalajara International Book Fair (FIL) is a mass gathering, hosting publishing companies from 40 countries and more than 750,000 visitors. It is necessary to prioritize preventive measures focusing on earthquakes, fires, terrorist acts, and prevention of infections. The objective of this study is to describe and analyze the health problems encountered during FIL 2013 in order to improve civil protection services during future events. **Material and methods:** Descriptive, cross-sectional study, collecting medical histories in accordance with Mexican Official Standard NOM-004-SSA3-2012, and classifying respondents into age groups. A total of 794 medical sheets for patients who received assistance at the Mobile Health Units were analyzed. **Results:** Altogether, 794 (0.1%) patients were medically evaluated out of 750,987 fair visitors during the study period. Of these, 32 patients were < 12 years old; 111 were 13-20 years old; 540 were 20-50 years old; and 111 were > 50 years old. There were no complicated medical cases. A favorable impact of preventives strategies was observed. **Conclusions:** Non-complicated medical incidents were observed. It is necessary to increase the knowledge on health among the general public who attend this type of event. Training health professionals is a priority in prevention measures and providing care during mass events of this kind in Mexico's territory. (Gac Med Mex. 2015;151:485-9)

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### Introduction

The Guadalajara International Book Fair (FIL – Feria Internacional del Libro) is the most important Spanish language event in Latin America, since it gathers publishing companies from more than 40 countries and has an attendance of more than 750,000 people<sup>1</sup>. The World Health Organization defines as massive

events all those acts with presence of a number of people enough to exceed the planning and response resources of a community, state or nation<sup>2</sup> and acknowledges that risks for health with potential medical and surgical requirements are increased during such acts.

Three international goals were designed for massive events: primary care and prevention of incidents, emergency care and response to major incidents<sup>3-6</sup>.

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Daily attendance is nearly 80,000 people, who remain in the facilities since one week before and up to one week after the event; close to 5,000 people are estimated to work in the event<sup>1</sup>. Organizational activities include civil protection of this population group, where preventive measures are established in case of natural disasters such as earthquakes and fire, and other violence events or terrorist attacks. In addition, a complete health service has to be available in an event of such magnitude, and for this reason, mobile medical units (UniMos) from the Hospital Civil de Guadalajara (HCG) were installed.

There are several already known factors that can affect massive events attendees; the most important include the fact that they come from different countries and make flight connections in international airports with high traffic of persons. Also standing out: dissemination of viruses and other pathogens due to high concentration of human beings, stress due to over-crowding, inadequate crowd movements, noise, light and other determinants<sup>5</sup>.

The purpose of this work is to describe and analyze health problems occurred during the development of the FIL 2013, aiming to improve civilian protection services of the event in future editions.

## Material and methods

This was an observational, cross-sectional study of the period encompassed from November 29 to December 7, 2013, including shelving assembly, development of the fair, and the corresponding disassembly.

During the assembly, the staff of the event was instructed on hand hygiene and on the use of disinfectant gel and masks if necessary. In addition, an earthquake or contingency drill was carried out by the FIL's organizers, where emergency exits and behaviors in such situation were identified; equipments to extinguish fire in case of such an event and the attitude to assume in case of terrorist attacks were also identified. Seven-hundred and ninety-four clinical files were included from all patients attended to at the UniMos.

Additionally, a portable shock unit room with advanced cardiovascular resuscitation equipment with defibrillators, oxygen, intravenous access lines and drugs was mounted, and two ambulances were available at every moment for patient transportation.

Clinical history was made according to the NOM-004-SSA3-2012 standard<sup>7</sup>, and subjects were classified based on age groups, separating diagnosis and treatment of each case. Special attention was established

in case of patients presenting with symptoms related to upper airways infection of the influenza type. Diagnosis and treatment was applied by specialist physicians, residents and physicians on social service belonging to the HCG's UniMos. Percentages were used for the description of quantitative variables.

## Ethical considerations

The study complies with the international clinical research principles established in the updated Declaration of Helsinki. Informed consent was obtained from each case and from the parents or legal guardians in the case of minors of age. The study was authorized by the HCG's Research and Ethics Committee. There are no conflicts of interest in the present study.

## Results

Seven-hundred and ninety-four patients (0.1%) were clinically assessed out of 750,987 attendees during the aforementioned period. For their study, they were divided into 4 age groups: 0-12 years, 13-20 years, 21-50 years and > 51 years.

In the 0-12 years group, a total of 32 patients (4%) were assessed. The most prevalent conditions were: pharyngitis (7 [21.8%]), lacerations and injuries within the facilities (18.75%), headaches (5 [15.62%]) and nausea and vomiting (3 [9.3%]). With regard to treatments, the most common were: general, dietary or psychological measures without drugs (14 [43.77%]), non-steroid antiinflammatory drugs (11 [34.37%]), wound dressing (3 [9.37]) and muscle relaxants (2 [6.25%]) (Table 1).

One-hundred and eleven 13-20-year patients (14%) were attended to. The most frequent conditions were: headache (30 [27.02%]), pharyngitis (19 [17.11%]), dysmenorrhea (12 [10.81]) and pyrosis (8 [7.2%]). Treatments were: general, dietary or psychological measures with no drugs (46 [41.44%]), non-steroid antiinflammatory drugs (32 [28.82%]), muscle relaxants (10 [9%]) and antiemetics (7 [6.3%]) (Table 2).

In the 21 to 50-year group, 540 patients (68%) were treated. Most frequent conditions were: headache (177 [32.7%]), pharyngitis (84 [15.5%]), injuries within the facilities (39 [7.22%]) and muscular pain (30 [5.5%]). Most common treatments were: general, dietary or psychological measures with no drugs (295 [54.6%]), non-steroid antiinflammatory drugs (155 [28.7%]), wound dressing (18 [3.3%]) and muscle relaxants (16 [2.9%]).

**Table 1. Diagnoses in the group under 12 years of age (pediatric subjects)**

Diagnosis	Frequency	%
Pharyngitis	7	21.80%
Injury/laceration	6	18.75%
Headache	5	15.62%
Nausea/vomiting	3	9.37%
Muscular pain	2	6.25%
Hyperthermia	2	6.25%
Mild trauma	2	6.25%
Toothache	1	3.12%
Dysmenorrhea	1	3.12%
Epistaxis	1	3.12%
Pyrosis	1	3.12%
Gastroenteritis	1	3.12%
No diagnosis	0	0.00%
Total:	32	100.00%

Finally, among the > 50 years attendees, 111 patients (14%) were assessed. Most common diagnoses were: headaches (25 [22.5%]), pharyngitis (16 [14.4%]), hypertension (13 [11.71%]) and trauma (6 [5.40%]). Treatments used corresponded to: general, dietary or psychological measures without drugs (54 [48.6%]), non-steroid antiinflammatory drugs (25 [22.5%]), arterial blood pressure measurement with no medication administration (13 [11.7%]) and wound dressing (9 [8.1%]) (Tables 4 and 5).

As for the third goal for health in massive events, we only had 5 patients brought to the HCG due to mild injuries (0.6%), two cases of syncope, one case of hypertensive crisis and one asthma attack<sup>5,6</sup>.

## Discussion

In massive acts, the risk for transmission of non-endemic diseases of the region increases due to the attendance of visitors from other zones, as it is the case of the FIL, which receives visitors from over 40 countries who make flight connections in other airports where they can contract and spread some infectious disease<sup>8</sup>. However, among the attended patients no persons were detected sick with this type of infections.

**Table 2. Diagnoses of 13 to 20-year old patients (adolescents)**

Diagnosis	Frequency	%
Headache	30	27.02%
Pharyngitis	19	17.11%
Dysmenorrhea	12	10.81%
Pyrosis	8	7.20%
Injury/laceration	7	6.30%
Syncope/lipotimia	7	6.30%
Nausea/vomiting	5	4.50%
Mild trauma	3	2.70%
Toothache	2	1.80%
Allergy/anaphylaxis	2	1.80%
Muscular pain	2	1.80%
Abdominal pain	2	1.80%
Anxiety crisis	2	1.80%
Others	2	1.80%
Insect bite	1	0.90%
Dog bite	1	0.90%
Hypoglycemia	1	0.90%
Craniocerebral trauma	1	0.90%
Total:	111	100.00%

In the time that takes to assemble the facilities of the fair, as well as its duration and disassembly, several accidents occurred and were reflected on all age groups, especially in the group of minors of age, which demonstrates that there is not a specific level of education for the prevention of accidents among the attendees and, therefore, these actions have to be reinforced<sup>9</sup>.

In our methodology, we used the regulations in force in the Mexican Republic with regard to the clinical record and the prescription of treatments and/or drugs. However, 54% of the patients attended to only required psychological support, general and/or dietary measures, and no drugs were administered, in contrast with other international reports<sup>3,10</sup>.

Three of the most important factors as causes for healthcare were environmental noise, low temperature of the venue and the excess of people, which has also been reported in other countries<sup>3,8,9</sup>.

**Table 3. Diagnoses of 21 to 50-year old patients**

Diagnosis	Frequency	%
Headache	177	32.7%
Pharyngitis	84	15.5%
Injury/laceration	39	7.2%
Muscular pain	33	6.1%
Dysmenorrhea	30	5.5%
Others	25	4.6%
Mild trauma	25	4.6%
Abdominal pain	21	3.8%
Pyrosis	14	2.5%
Arterial hypertension	14	2.5%
Allergy/anaphylaxis	13	2.4%
Acute diarrhea	11	2.0%
Syncope/lipothymia	10	1.8%
Nausea/vomiting	8	1.4%
Toothache	8	1.4%
Ophthalmologic problems	5	0.9%
Insect bite	3	0.5%
Soft tissue infection	3	0.5%
Anxiety crisis	3	0.5%
Diabetes mellitus	3	0.5%
Asthma	2	0.3%
Otic problems	2	0.3%
Epistaxis	2	0.3%
Metrorrhagia	2	0.3%
Urinary tract infection	1	0.1%
Balanitis	1	0.1%
Hypoglycemia	1	0.1%
Total:	540	100.0%

In the 20 to 50 years of age group we observed as main ailments those related to the stress of the event itself and the conditions of the air conditioning of the facilities. These data are in contrast with ailments identified in the elderly, where potential decompensation of primary degenerative diseases might require specific care during these events.

**Table 4. Diagnoses in > 50-year old patients**

Diagnosis	Frequency	%
Headache	25	22.5%
Pharyngitis	16	14.4%
Others	13	11.7%
Arterial hypertension	13	11.7%
Mild trauma	3	5.4%
Injury/laceration	6	5.4%
Muscular pain	6	5.4%
Abdominal pain	5	4.5%
Diabetes mellitus	4	3.6%
Pyrosis	4	3.6%
Acute diarrhea	2	1.8%
Hypoglycemia	2	1.8%
Ophthalmologic problems	2	1.8%
Nausea/vomiting	1	0.9%
Syncope/lipothymia	1	0.9%
Lymphangitis	1	0.9%
Gout attack	1	0.9%
Otic problems	1	0.9%
Allergy/anaphylaxis	1	0.9%
Mild craniocerebral trauma	1	0.9%
Total:	111	100.0%

**Table 5. Treatments in > 50-year old patients**

Treatment	Frequency	%
General, dietary or psychological measures with no drug treatment	54	48.6%
Non-steroid antiinflammatory drugs	25	22.5%
Blood pressure measurement	13	11.7%
Wound dressing	9	8.1%
Antihypertensive drug	5	4.5%
H2-anatagonist	2	1.8%
Antibiotics	1	0.9%
Antiemetic/prokinetic	1	0.9%
Muscle relaxant	1	0.9%
Total:	111	100.0%

Earthquake and fire drills, as well as warnings on behavior in case of terrorist attacks were gently accepted by the FIL staff, about 5,000 people, thus increasing the index of safe and effective behavior in case of a contingency of that nature would rise.

As for the third goal for health in massive events, only 5 patients (0.6%) had to be brought to the hospital (HCG) due to mild injuries, two cases of syncope, one case of hypertensive crisis and an asthma attack<sup>5,6</sup>.

All this information supports the preventive strategies and recommendations directed to the different age groups that participate in massive events and enables strategic planning for healthcare personnel as to efficiently attend to and react to potential incidents in the area of public health.

Detailed considerations apply to these measures according to international experiences for school and sports events and in particular for specific cases of epidemiological alerts monitoring, which eventually require a fast-testing laboratory infrastructure to opportunely identify risks for transmittable diseases<sup>11-14</sup>.

## Conclusions and actions for prevention

Planning and coordination in the area of health of the 27<sup>th</sup> edition of the FIL demonstrated to be a highly efficient factor in the prevention and care of people who required it. Prevention measures for disaster, accidents and acts of panic or terrorism were very well established and practiced with drills among exhibitors and staff of the venue.

The cases of headache, pharyngitis and non-serious accidents had the highest incidences during the event. No infectious processes were detected resulting from transmission by vectors, foods or specific infections such as influenza.

The relevance of the preventive education strategies for the population of attendees is ratified, as well as the planning, preparation and training in healthcare personnel to improve the strategies of attention and reaction in case of sanitary incidents during massive acts.

Preventive information strategies should be established in order to raise the health education level of the population attending to this type of events in order to prevent complications or health risks, such as those that occurred here.

Very importantly, healthcare personnel should be trained on prevention, care and epidemiological

surveillance within the standards of clinical practice guidelines and critical routes operating in decision making. The diagram of the so-called mass gathering emergency medicine should consider and include in its strategies the emergency medicine, medicine on natural disasters and civilian protection, medicine of the traveller and specific management of epidemiological risks associated with transmittable diseases.

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