



Mass casualties management in major disasters

Tuesday 22 May 10h30 – 16h00
Mass casualties management in major disasters

MCMIMD1

**“STAND AND PLAY, SCOOP AND RUN”
 QUEL PROCÉDÉ CHOISIR ?**

M. Essoussi, A. Hlali, M. El Ghoul, M.H. Manai
 Service de Chirurgie Viscérale et Générale - HMPIT

MCMIMD2

**STRINGENT MEDICAL RESCUE AND THE WOUNDED DISPOSAL FOR LARGE
 SCALE DISASTER**

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MCMIMD3

**UNITED STATES DEPARTMENT OF DEFENSE MILITARY HEALTH SYSTEM ROLE
 IN NATURAL DISASTER RESPONSE.**

D.Tarantino (USA)

MCMIMD4

AVANCÉES TECHNOLOGIQUES DANS LA PRISE EN CHARGE DES BRÛLÉS

C.Garsin (FRANCE)

MCMIMD5

**CHALLENGES OF DISASTER MANAGEMENT IN SUB-SAHARAN AFRICA:
 DEFINING THE PROBLEMS**

COL OA OGUNBIYI1 FWACS, FMCA, FICS - BRIG GEN HMA AGADA2 FWACS, FMCS, FICS - DR. I
 MIJINYAWA3 FWACP
 Departments of Anaesthesia¹, Surgery², and General Outpatients³, 44 Nigerian Army Reference
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MCMIMD6

**AN OPTIMIZED DECISION-SUPPORTING SYSTEM FOR MILITARY EMERGENCY
 MOBILE MEDICAL RESOURCE PLANNING IN REGIONAL MAJOR DISASTERS**

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MCMIMD7

ASISTENCIA SANITARIA A BAJAS EN MASA EN CATASTROFES

Relanzon (SPAIN)

MCMIMD8

**THE USE OF SPECIALIZED MOBILE GROUPS OF SANITARY AND
 EPIDEMIOLOGICAL INSTITUTIONS IN EXTREME SITUATIONS OF PEACETIME**

A.R. Volgin, I.V. Kholikov, V.N. Rusakov, L.A. Yanshin
 Main Military Medical Directorate of the RF MoD, Main Center of the State -
 Sanitary and Epidemiological Control of the RF MoD

MCMIMD9

**WEAK AND STRONG POINTS IN PREHOSPITAL COMMAND AND CONTROL –
 ARE RESULTS POSSIBLE TO MEASURE?**

Lt Col Lars Lundberg MD PhD1, Anders Rüter MD PhD2
 1 Swedish Armed Forces Medical Centre, Gothenburg, Sweden
 2 Centre for Teaching and Research in Disaster Medicine and Traumatology, Linköping, Sweden

MCMIMD10

**ORGANISATION DES SECOURS FACE A UNE INTOXICATION CHIMIQUE
 COLLECTIVE**

Médecin Colonel BEKKOUCHE N. (Algérie)

MCMIMD11

**EXPERIENCE DU SERVICE DE SANTE ALGERIEN DANS LA REPOSE AUX
 TREMBLEMENTS DE TERRE :
 CAS DU SEISME DE BOUMERDES.**

Med Lt Col A. DEKHILI, Med Gle S. KHALFA

MCMIMD12

THE 2005 KASHMIR EARTHQUAKE – THE DUTCH USAR EXPERIENCE

Commander Floris J. Idenburg, surgeon – Royal Netherlands Navy Reserve
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MCMIMD13

**MILITARY HUMANITARIAN ASSISTANCE AND
 MEDICAL SUPPORT IN BAM EARTHQUAKE**

M R Jahani1, H Shirzad2
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 2 Health Headquarters of IRI Police Force, Tehran, Iran

MCMIMD14

**ITALIAN ARMY MOBILE MEDICAL UNIT: A REAL SUPPORT IN MASS
 CASUALTIES**

Col. Roberto BRAMATI, IT Army MC
 Col. Enzo LIGUORI, IT Army MC

MCMIMD15

TRAGIC BURN DISASTER IN POLYGON AREA

MAJ UYGUR Fatih, MD1, 1LT OKSUZ Sinan, MD1, COL YUKSEL Fuat, MD1, COL CELIKOZ Bahattin, MD1.
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MCMIMD16

DISASTER HEALTH MANAGEMENT AND ETHICAL BOUNDARIES

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MCMIMD17

TREATMENT STRATEGIES FOR MASS BURN CASUALTIES

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MCMIMD18

**EXPERIENCIA DEL HOSPITAL MODULAR DE CAMPAÑA DEL EJÉRCITO DE
 CHILE EN APOYO A LA COMUNIDAD**

GDB. Alejandro Mandujano Bronfmann
 Comandante de Salud y Jefe de Sanidad del Ejército de Chile

MCMIMD19

**MASS AMMONIA ACCIDENT - AN EXAMPLE OF PREPAREDNESS OF THE
 NATIONAL POISON CONTROL CENTRE, MILITARY MEDICAL ACADEMY IN
 BELGRADE**

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MCMIMD9

WEAK AND STRONG POINTS IN PREHOSPITAL COMMAND AND CONTROL – ARE RESULTS POSSIBLE TO MEASURE?

Lt Col Lars Lundberg MD PhD1, Anders Rüter MD PhD2

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2 Centre for Teaching and Research in Disaster Medicine and Traumatology, Linköping, Sweden

Background: Performance indicators have recently been introduced as a tool for scientific evaluation of the prehospital command and control in the civilian management of mass casualties. The use of measurable performance indicators could lead to a more specific evaluation also in a military setting. This would provide a possibility to specify more accurately likely areas for improvement.

Methods: A set of previously developed performance indicators for prehospital command and control has been applied to different military scenarios, covering the initial decision-making in the on scene medical management.

Results: From a total of eleven proposed performance indicators, the standards set for civilian use should be able to meet in most cases. The performance indicator where the goal is most likely not to be achieved is to have the first patient evacuated within 15 minutes.

Conclusions: Measurable performance indicators for prehospital command and control could to some extent be applicable also in a military environment. Future developments may lead to that the concept of measuring results using performance indicators could become a quality control tool also in a military setting.

MCMIMD10

ORGANISATION DES SECOURS FACE A UNE INTOXICATION CHIMIQUE COLLECTIVE

Médecin Colonel BEKKOUCHE N. (Algérie)

Des accidents chimiques collectifs graves ont frappé des populations dans différents pays dans le monde.

- Usine chimique SEVESO-ITALIE LE10 juillet 1976.

- Usine UNION CARBIDE BHOPAL- INDE le 03 décembre 1984 (2000 morts immédiat, 6500 morts officiels, 70.000 personnes impliquées).

- Dispersion de SARIN dans 05 wagons de métro de TOKYO par des membres de la « Secte AUM SHENRI KYO » « le 20 mars 1995 12 morts et 5500 intoxiquées.»

Ces différentes catastrophes interpellent les responsables locaux non préparé à ce type d'événement, à mettre en place un dispositif d'organisation des secours, voir une véritable stratégie générale face à une intoxication chimique collective (intoxication par gaz, vapeur, aérosol) car les intoxication par ingestion relève d'une autre stratégie. Et pour diminuer l'incidence de ces accidents, il faut mettre on place politique de prévention, de préparation et de réponse adaptée à chaque type d'accident.

MCMIMD11

EXPERIENCE DU SERVICE DE SANTE ALGERIEN DANS LA REPONSE AUX TREMBLEMENTS DE TERRE : CAS DU SEISME DE BOUMERDES.

Med Lt Col A. DEKHILI, Med Gle S. KHALFA

Le séisme est une catastrophe naturelle qu'on ne peut prévoir, ni dans le temps, ni dans le lieu. Néanmoins, ne peut-on pas tirer des enseignements des expériences vécues, à travers le monde, en matière de prévention, de construction parasismiques, de préparation de plans d'organisation de secours et de prise en charge médicale des blessés ?

De nos jours, des actions ont été mises en place pour minimiser les conséquences dramatiques d'un séisme d'ampleur majeure.

A Boumerdes, le mercredi 21 mai 2003 au soir, la secousse de magnitude 6.8 sur l'échelle de Richter a plongé la population dans le désarroi. Les autorités, surprises par l'événement ont engagé l'armée algérienne pour la gestion de cette catastrophe naturelle de grande ampleur. Les Services de santé militaire ont joué un rôle remarquable, en engageant tous les moyens humains et matériels et organisationnels disponibles pour la prise en charge des sinistrés, depuis les décombres jusqu'aux hôpitaux et depuis l'alerte jusqu'à la phase de réhabilitation. Passée la phase immédiate classique de panique de la catastrophe, et après une reconnaissance aérienne de nuit, les opérations de secours étaient axées sur : la prise en charge médicale et l'évacuation des blessés, la mise en place de camps de

sinistrés, la gestion des cadavres, la prise en charge psychologique des sinistrés en particulier les enfants sans parents, l'approvisionnement en eau et vivres, la mise en place des mesures préventives hygiéno-épidémiques, l'intégration des moyens civiles et militaires, nationaux et internationaux, ainsi que la gestion des médias ; et tout cela dans un contexte de haute sécurité du fait que la zone était sujette à des actes terroristes profitables. Les Services de Santé Militaire Algériens ont acquis ainsi, une expérience louable en matière de gestion des désastres naturels dans un contexte particulier, ils en feront part à l'occasion du XXXVII^e Congrès Mondial de Médecine Militaire à Tunis.

Mots clés : Séisme de Boumerdes, Gestion d'une catastrophe majeure, participation des Services de Santé Militaire Algérien.

MCMIMD12

THE 2005 KASHMIR EARTHQUAKE – THE DUTCH USAR EXPERIENCE

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The author is a general surgeon and member of the Dutch Urban Search & Rescue Team (www.usar.nl). He is experienced in civilian and military traumatology, including peace keeping missions in Bosnia-Herzegovina, Liberia and Afghanistan. The author will describe and illustrate the unexpected events during an USAR deployment. It is a personal story of lessons learned from a major disaster.

On 8 October 2005 a devastating earthquake (7.6 on the Richter scale) hit the northern parts of Pakistan and India, killing more than 80.000 people and wounding some 100.000. More than 3 million people were left homeless. In some urban areas the majority of buildings sustained damage or collapsed. The unreinforced solid concrete block masonry buildings could not withstand the tremendous forces, which were responsible for the majority of injuries and deaths.

Because of an official request by the Pakistan government, the Dutch USAR-team was immediately dispatched to the destroyed city of Bagh near the epicenter of the earthquake, in the mountainous area of the Pakistan-administered section of Kashmir. The official task of the USAR-team is to search for survivors of disasters. The team consists of dog-handlers, fire brigade workers and technical and logistical specialists. Normally, the medical task of USAR.NL is limited to providing first-aid to the survivors until they reach the local medical system. The medical personnel of the team include five experienced EMT's and one traumatologist.

Due to the circumstances in Kashmir, the chances for survival were small. Despite working round the clock, the Dutch USAR team did not find one single survivor. Instead of searching for survivors, they took part in caring for thousands of wounded people that had managed to escape their remote villages. In those first days after the quake, the chaos was complete: bad weather, mountainous terrain, landslides, blocked roads, aftershocks. Medical assets were destroyed. Erratic or absent electricity and limited food and water supplies hampered relief efforts. Nonetheless, the ingenuity and motivation of the collaborating rescue teams - including members of the Pakistan Army Medical Corps - substantially improved the situation of the earthquake victims.

MCMIMD13

MILITARY HUMANITARIAN ASSISTANCE AND MEDICAL SUPPORT IN BAM EARTHQUAKE

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Introduction: Bam in south-east Iran was shattered on 26 December 2003 by an earthquake that lasted just 10 seconds and measured 6.5 on the Richter scale. More than 35,000 people killed, 23,620 injured (8028 of them seriously) and almost 20,000 homes destroyed. This report provides a brief review of the extent of the damage, the health problems encountered and the management strategies introduced to minimize morbidity and mortality in the aftermath of the earthquake by Iranian military force in immediate phase.

To cover the needs of the affected people, Bam was divided into 14

zones, each one allotted to a certain province. Military assistance was categorized into Search and rescue, Triage and stabilization, Evacuation, Medical care and Outpatient management, Recovery, Transient Settling and Reconstruction.

DISCUSSION: Due to Iran's geographical and geological situation, further earthquakes are inevitable. The experience gained as a result of the disaster at Bam provided Iranian health officials with a valuable learning opportunity, and identified areas where improvements can be made to respond to such a disaster quickly and efficiently

MCMIMD14

ITALIAN ARMY MOBILE MEDICAL UNIT: A REAL SUPPORT IN MASS CASUALTIES

Col. Roberto BRAMATI, IT Army MC
Col. Enzo LIGUORI, IT Army MC

Medical assistance is one of the functions of the military logistic branch dedicated to satisfy all personnel psycho-physical necessities. With the purpose to clarify how functionally medical support is assured we shortly recall different levels of organization. Health support is divided in Role in relation to level of medical care disbursed that exponentially increase from level 1 up to level 4. Every Role will be endowed with material and personnel calibrated to the assignment. We can start a view of Italian Army medical equipments with a short story of the field medical equipments development. From 2nd world war several years of studies and experiments had a considerable evolution in the field medical structures, At the beginning we have cotton tents for every use but surgical theatre was developed from a tent to a surgical cart. This hospital was deployed in Lebanon in 1981 and in North Iraq in 1991. Operational use in those two countries and medical assistance task for local civilian population pointed out some limits, so after a study, also comparative with other nations equipments we decided to connect the tents to each other in order to have aid units for patients treatment in therapeutic block systems. Army Headquarter decided to replace the cotton tents structure with a "closed circuit" structure build with inflatable tents more hygienic, less heavy and with a fast assemblage. Surgical capability increase with the realization of a surgery room and an intensive care room inside a varying geometry shelters, that once closed can be transported inside a CH47 helicopter or C130 aircraft. The success of such structures led to the creation of analysis lab and pharmacy shelters and currently a TC scan shelter for field use. Now we can deploy a modular system for medical support concerning the tasks with the possibility to increase surgical capability with a two surgical bed operating room (MODULMED system and IRVING system) and a five intensive beds shelters (IRVING system) Long lasting operations recommended to build a real hospital with a comfortable life standard and so we are able to replaced tents with containers.

We hope in a continuous exchange of experience, to give our help to the rebuilding of peace in the world for freedom and cultural evolution of the peoples.

MCMIMD15

TRAGIC BURN DISASTER IN POLYGON AREA

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Objective : Our aim in this study was to provide insight into organizational requirements of a major burns incident in polygons and the results may be of importance for future planning of burn disaster management in these area.

Material and method : A tragic in-door fire disaster took place on June 1st 2006 at a polygon. 10 people attending shooting training and the 4 staff of the polygon were inside the building when explosion burn started. 7 of the wounded patients were treated in our burn unit.

Results : On the analysis of the causes of explosions during our study, the following measures, we believe, could bring down the incidence of this burn injury significantly. Safety regulations must be established. Regular inspection of electrical circuits is of great importance to prevent short-circuit. Improvement to the equipment and isolation material against to melting gunpowder. Acceptable evacuation measures and local fire extinguishing precautions should be strictly provided against the explosion and burn risks. We consider that these

places should be located in a separate building out of the residential area. In case of a fire disaster inhalation burn injury risk is high in these places.

Conclusion : Polygon area is generally assumed safe against to gunpowder explosion. However, it should be kept in mind that gunpowder explosion in this area is possible and strict measure should be taken against the disasters. In case facing with these victims, increased attention should be paid to the respiratory support during the early post-burn period.

MCMIMD16

DISASTER HEALTH MANAGEMENT AND ETHICAL BOUNDARIES

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Over the course of the twentieth century, more than 159 million people have died as a result of war or natural disaster. The death toll from the two world wars exceeded 80 million, and nearly an equal number were exterminated during the century in genocidal campaigns. In the great wars, about as many soldiers died as civilians; the victims of natural disaster were all civilians. These terrible human losses have led some to label our time a "century of megadeaths".

Humanitarian relief workers -both civilian and military- encounter most of ethical boundaries in the course of health management. How can health professionals work alongside military forces while maintaining the practice as well as the perception of medical neutrality among civilians and combatants? What should be the level of tolerance? What can be done when the witnessing and reporting of human rights abuses are incompatible with the mission of those who need to maintain a presence in the field to continue serving the innocent? What should be the 'health voice' when punitive economic sanctions affect not the perpetrators but the civilian populace? Health workers must be prepared to deal with ethical boundaries in the humanitarian disasters. This study attempts to present general principles of medical ethics for the health workers in order to function effectively in disaster health management.

MCMIMD17

TREATMENT STRATEGIES FOR MASS BURN CASUALTIES

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Objective: Mass burn casualties are always a great challenge to a medical team because of a large number of seriously injured patients were sent in within a short time. Usually a high mortality is impending. Experiences gained from successful treatment of the victims may further improve first aid at the scene, the care during transportation from a remote site, and successful treatment in the burn unit receiving the patients, who had already endured a harsh environment at the site of the accident, inadequate initial care and long transportation. The experiences gained may be useful in guiding the care of mass casualties in an armed conflict.

Materials and Methods: Thirty-five burn victims in a single batch, being transferred nonstop by air and highway from a distant province, were admitted 48 hours post-injury on June 28, 2006. All patients were male with a mean age of 24.4 ± 6.3 years. The burn extent ranged from 6% to 75% TBSA ($15.7\% \pm 13.9\%$). Among them, thirty-two patients were complicated by moderate and severe inhalation injury, and tracheostomy had been performed in 15 patients. Decompression incision of burn eschar on extremities were done in 17 cases before transportation. All the thirty- five patients arrived at the destination smoothly via 4-hour airlift. Among them, twenty-five patients were in critical condition, while other ten were in relatively stable condition at admission (first admitted to another hospital in Beijing).

Results and discussion: These thirty-five patients were evacuated 6 hours from the scene of the injury, and they were transferred to a local hospital for primary emergency care. The patients were in very poor condition when they were admitted to our hospital because of the severe injury with delayed and inadequate treatment. Examination of these patients at admission showed that one patient was suffering

from sepsis and MODS. Dysfunction of the heart, lung, liver, kidney, and coagulation were found in all the patients. Forty-eight operations were performed in the 24 patients during one month together with comprehensive treatment, and the function of various organs was ameliorated after appropriate treatment. All thirty-five patients survived.

Conclusion: The experience of success can be summed up as follows: There was a well organized team consisting of several cooperative groups with specified duties. As a whole, the treatment protocol should be individualized, basing on the extent of the injury and the care he had received at the spot. The treatment protocol in our hospital consisted mainly of prompt effective relief of all life-threatening complications, followed by early closure of burn wounds, appropriate use of anti-infection therapy, emphasis on nutritional support, correction of metabolic disorders, alleviation of immunosuppression, correction of coagulopathy, and effective support and protection of organ function. All these efforts were contributory in successful treatment of these patients. Skillful plastic and cosmetic surgery is mandatory to take care the deformities of the face and joints to guarantee the restoration of the function and external appearance of the patients.

References:

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2. J.K. Chai, Z.Y. Sheng, J.Y. Lu, et al. Clinical characteristics and treatment strategies of burn-blast combined injury. *Nat Med J* (Article in press, accepted 3 Jan 2007).

MCMIMD18

EXPERIENCIA DEL HOSPITAL MODULAR DE CAMPAÑA DEL EJÉRCITO DE CHILE EN APOYO A LA COMUNIDAD

GDB. Alejandro Mandujano Bronfmann

Comandante de Salud y Jefe de Sanidad del Ejército de Chile

Introducción : Se presenta la experiencia del Hospital Modular de Campaña del Ejército de Chile (HMCE.) en operativos de apoyo a la comunidad realizando 1194 intervenciones quirúrgicas de Cirugía Mayor Ambulatoria con Anestesia General y Regional.

El HMCE. es de fabricación Alemana y Española, de diseño rígido tipo contenedores y carpas de moderna tecnología, destacando en su conformación pabellón quirúrgico, con apoyo en recuperación post operatoria y unidad de tratamiento intensivo, radiología básica, laboratorio clínico, esterilización, unidad de atención y urgencia, salas de hospitalización, baños, etc; lo que se complementa con el correspondiente apoyo logístico: cocinas, frigorífico, lavandería, carpa comedor, carpa dormitorios de personal, baños, grupo electrógeno, purificador y desalinizador de agua, transporte, etc. Es servido en esta configuración por 44 técnicos, 3 Cirujanos y 2 Anestesiistas.

Los pacientes pertenecen al Sistema de Salud Estatal, aportados por el Ministerio de Salud Pública a través de Convenios Asistenciales, con el propósito de colaborar a disminuir las listas de espera de cirugía en las patologías más prevalentes de nuestro país

El HMCE. se ha desplegado a lo largo del territorio nacional en 18 ciudades de distintas características geográficas y meteorológicas realizando operativos de atención quirúrgica entre SEP.2001 y NOV.2006.

Se presenta un análisis de experiencias y resultados

Se intervinieron 1186 pacientes realizando 1194 intervenciones quirúrgicas (1147 adultos y 47 niños) : 447 Colectomías Laparoscópicas, 9 Colectomías abiertas, 470 Hernioplastías, 162 facoerisis extracapsular con lente, 47 cirugías urológicas, 39 amigdalectomías y otras 23 intervenciones como apendicetomía, ginecomastia, aseo quirúrgico, etc.

Se realizaron 1349 exámenes de laboratorio (Hematológicos y Bioquímicos), 242 exámenes radiográficos (Radiografías de tórax, abdomen y óseas) y 146 electrocardiogramas.

Seis (6) complicaciones requirieron cirugía (0.5%): 2 hematomas de herida operatoria en hernioplastía, 1 hematoma subhepático posterior a una colectomía laparoscópica, 1 hemoperitoneo post operatorio, 1 lesión puntiforme de colédoco, y 1 colédocolitiasis residual resuelta. No hay mortalidad.

Conclusión : El HMCE. es una instalación Sanitaria compleja nivel 3, donde es posible realizar Cirugía Mayor Ambulatoria. Esto permite una real ayuda a la comunidad y mantener permanentemente entrenado a

su personal para responder a eventualidades de emergencia de la comunidad nacional o a una solicitud de colaboración internacional.

MCMIMD19

MASS AMMONIA ACCIDENT - AN EXAMPLE OF PREPAREDNESS OF THE NATIONAL POISON CONTROL CENTRE, MILITARY MEDICAL ACADEMY IN BELGRADE

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The risk of mass exposure to toxic substances is increasing steadily due to the expansion of industry and deliberate development and use of chemical warfare agents. Despite the frequent occurrence of Haz-Mat incidence, organization and management of mass casualties still pose some specific problems. Most hospitals with emergency care are not fully prepared to handle contaminated or poisoned patients, which may have such number, severity and diversity of injuries that can overwhelm the ability of local medical resources to deliver comprehensive and definite medical care.

Objective: to review the role of the National Poison Control Centre (NPCC), Military Medical Academy (MMA), Belgrade in organization and management of mass ammonia poisoning.

Results: The accident happened on May 27th 1998 at 14:00 hrs near Belgrade, when a road tanker with 2,5 tones of ammonia exploded. A cloud of ammonia gas spread over the vast area causing mass poisoning of local residents. The duty physician in NPCC was informed at 14:40hrs. A plan prepared for Haz-Mat accidents regarding chain of command, with triage physicians, a nurse in charge and emergency staff was put into motion immediately. Additional hospital beds and supplies of drugs and other material were provided. The total of 143 patients was treated in MMA, 54 were hospitalized. Severe poisoning was registered in 19 patients; 9 developed pulmonary edema, 6 severe burns of eyes and skin, 2 required mechanical ventilation. Multispecialized team work (toxicologist, pulmonologist, plastic surgeon, ophthalmologist) was necessary. One patient deceased on the 6th day, and 4 patients developed permanent sequelae.

Conclusion: High quality of treatment, multispecialized teams and military organization of the National Poison Control Centre, MMA are responsible for successful treatment of this mass chemical accident. It also indicates preparedness of MMA for major disaster, terrorist attack and whenever there is a need for mass casualties' management.