

# Communicable disease alert and response for mass gatherings

Technical workshop

Geneva, Switzerland  
29 –30 April 2008



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## **Introduction**

Mass gatherings (MGs) of any nature present specific challenges for authorities in maintaining public health and controlling communicable diseases. The influx of a large number of people together with changes in local infrastructure place a severe strain on national health and support services, compromising the authorities' ability to detect and respond to a problem.

In recent years the Department of Epidemic and Pandemic Alert and Response (EPR) of the World Health Organization (WHO) has responded to an increasing number of requests from its Member States for support in preparing for MGs and the associated public health challenges. In 2007, to meet this growing need, WHO developed the first draft of a comprehensive Guidance Document entitled *Communicable disease alert and response for mass gatherings: key considerations*. The document is designed to help countries hosting MGs assess the level and nature of the public health risks and the capacity of existing systems and services in order to anticipate public health needs for the duration of the occasion. The primary focus of the Guidance Document is alert and response to outbreaks of communicable diseases. However, the principles and practices described may prove valuable in planning other aspects of MGs.

From 29 to 30 April 2008, WHO hosted a technical workshop in Geneva to review the draft Guidance Document, to discuss wider issues of concern in controlling the spread of communicable diseases during MGs and to consider further work needed in this field. Participants included over 30 experts from around the world with direct experience of managing public health risks during MGs, as well as a wide range of WHO technical staff from Regional Offices and Headquarters.

This report provides a summary of the discussions and agreements reached during the workshop.

### **Aims and objectives of the workshop**

The specific objectives of the workshop were as follows:

- to reach consensus on the scope of WHO's work in the area of communicable disease risk management in mass gatherings and to define the terms being used;
- to review the draft Guidance Document;
- to discuss other issues of concern in the area of mass gathering medicine that had not yet been addressed;
- to share experience from previous MGs; and,
- to identify next steps and useful tools to be developed as part of the work of the WHO programme on mass gathering medicine.

### **Outcome**

During the workshop, participants identified areas in which the draft Guidance Document could be improved and expanded. A number of the participants agreed to serve on an Editorial Board to refine the Guidance Document prior to publication in June 2008. Others agreed to form a Virtual Inter-disciplinary Advisory Group for Mass Gatherings to guide the work of WHO in this area over the coming years.

## **1. Introductory discussion**

### **1.1 Definition of terms and scope**

A **mass gathering** of persons is usually defined as more than a specified number of persons at a specific location for a specific purpose for a defined period of time.

The number of persons may be as few as 1000, although much of the available literature refers to gatherings exceeding 25 000 persons. MGs can broadly be divided into those that are planned well in advance and those that are spontaneous or take place at very short notice. Planned MGs may be one-off occasions, such as a royal wedding, may be repeated regularly but at different locations, such as the Olympic Games, or may be held regularly at the same location, such as the Hajj.

Participants agreed that in the context of public health, a mass gathering should be defined as any occasion, either organized or spontaneous, that attracts sufficient numbers of people to strain the planning and response resources of the community, city or nation hosting the event.

It is important to note that for the purposes of the workshop, the Guidance Document and other associated products that may be developed by WHO, the term '**event**' refers to a manifestation of disease or an occurrence that creates a potential for disease, as defined by the International Health Regulations 2005 (IHR 2005), and is not used to refer to individual functions or contests that may take place during the course of a MG.

Participants noted a number of characteristics common to all MGs:

- they take place within a confined time span and location
- they can be unpredictable
- priority given to enhancing the capacity of public health related services is usually triggered by political interest, public or media scrutiny, national pride or a combination of these factors.

### **1.2 Political commitment**

Although the overall responsibility for communicable diseases during MGs usually lies with a senior communicable disease director, high level political commitment is essential. Public health professionals are increasingly involved at the highest level in planning for MGs and, where this is not the case, the communicable disease director should seek to communicate as much as possible with other political and organizational entities. Planning for MGs provides valuable opportunities for competing agencies to work together, as seen during the 2004 Olympic Games in Athens for example, can build a solid foundation for communicable disease control in the future and is an opportunity to improve existing systems and channels of communication.

### **1.3 Effective planning**

Algorithms are useful tools in planning and preparing for a MG. Organizers can chart the impact of potential communicable diseases, the demographics of those attending, such as age and health status and the health implications of any expected climatic conditions.

The process of planning a response to a potential outbreak of communicable disease during a MG should:

- differentiate between slowly evolving events and rapidly unfolding ones;
- take into account the relative severity and impact of different types of disease events; and
- consider the possibility of unanticipated incidents.

Effective and well understood lines of communication between public health authorities, health care services and emergency operations units at all levels are an essential part of planning.

#### **1.4 Surveillance systems**

Ideally, surveillance systems for communicable diseases should also be able to provide alerts for non-CD events, such as chemical-related events or those triggered by extremes of heat or cold, and should be adaptable to a variety of different settings. The role and evaluation of syndromic surveillance during MGs requires further consideration. Further work is also needed on appropriate indicators for evaluating the effectiveness of surveillance systems in MG.

#### **1.5 Documenting activities**

Authorities engaged in planning communicable disease surveillance and response for a MG should document their efforts and activities as they proceed. Personal accounts of experiences or 'lessons learned' are as important as formal records and should include details of planning, training and exercises. Making these reports publicly available in the appropriate media, such as regional newspapers or niche publications, is equally important, and should be decided in advance. Participants noted that an event-free, successful MG is rarely acknowledged while failures are often exaggerated. Information should be evaluated accordingly.

#### **1.6 Useful resources**

The following useful resources and initiatives were highlighted by participants at the workshop:

- a toolkit for public health preparedness for international events, produced by the Health Protection Agency (HPA), UK, based on documents prepared for the International Federation of Association Football (FIFA) World Cup 2010, South Africa;
- a project being undertaken by the Robert Koch Institute in collaboration with Dutch colleagues and funded by the European Union to gather experiences and lessons learned from mass gatherings;
- a tender issued by the European Centre for Disease Prevention and Control (ECDC) for procedures for doing risk assessments for MGs.

#### **1.7 Specific recommendations for the Guidance Document**

The purpose of the Guidance Document should be to assist national authorities in assessing their level of preparedness, identifying any shortfalls and improving capacities. It should be used as a guide and should not be seen as prescriptive.

Specifically:

- further editorial work is needed to incorporate the wealth of expertise and knowledge from recent MGs into the Guidance Document;
- terms used, such as 'mass gathering', should be clearly defined and, in view of the wide variety of MGs and the different threats they pose, a broad classification of MGs is recommended, together with illustrative examples;
- common terminology should be used as much as possible and where technical terms and jargon is unavoidable, a glossary should be included by way of explanation;
- issues concerning communicable diseases should be placed in a wider context;
- the Guidance Document should include a series of actual case studies supplied by individuals with direct experience of communicable disease control at the national level;
- an index and list of useful resources should also be included;
- document references should be reorganized using specific criteria;
- links to current WHO documents should be provided in the Guidance Document.

## **2. Risk assessment**

### **2.1 Definition of terms and scope**

Further work is needed to define the nature and types of risks in the context of MGs, as well as the scope and purpose of risk assessments (RA). Factors of relevance to an RA should include:

- incidence and prevalence of locally endemic diseases
- vaccination status of the local population
- seasonality of locally endemic diseases
- participant demographics including socio-economic status
- behaviour patterns of participants
- disease incidence and prevalence among participants
- nature of planned accommodation
- cities and/or districts involved
- systems and infrastructure in affected areas
- duration of the MG.

An RA should be a multi-disciplinary, iterative and dynamic process with several self-learning steps. It should guide prevention and health promotion activities, well in advance of an MG, and should ideally be conducted in collaboration with partners from other relevant agencies, including law enforcement. Risks should be quantified according to response requirements.

### **3. Surveillance & epidemiology**

The results of the risk assessment will determine the type and level of surveillance required and an assessment of existing surveillance capacities will identify where improvements are needed. Participants stressed the difference between normal surveillance requirements and those needed during MGs and noted particular considerations as follows.

#### **3.1 Political and policy considerations**

Statutory requirements for surveillance, in the context of MGs, require advanced planning along with the national and international communication channels. Personnel with the necessary epidemiological and data skills must be identified well in advance, including surge capacity. Policy discussions should take account of the inherent tension between the need for evidence-based surveillance, political requirements and respect for individual privacy. Stakeholders must be briefed on the public health value of a surveillance system in the context of an MG.

#### **3.2 Definition of objectives and priorities**

Surveillance systems require clearly defined objectives. These will help prioritize activities, particularly when finances are limited.

#### **3.3 Data and data sources**

The extent to which information from surveillance data will be provided to the media should be discussed and agreed in advance. Discussions should also consider the value of using non-traditional data sources for surveillance, such as syndromic surveillance. Reporting sites need to be identified and staff trained. Budgets and planning should take account of information technology (IT) requirements, time needed in advance of the MG to put systems in place, who should receive surveillance data throughout the MG and communication channels across the system.

In defining a surveillance system, participants recommended specific consideration be given to the following:

- standardized case definitions
- agreed baselines for the incidence of specific diseases/syndromes
- zero reporting if resources allow
- speed of results
- signals or triggers for defined action
- a working feedback mechanism
- possible integration of surveillance systems for communicable diseases with chemical and environmental incidents.

#### **3.4 Laboratories**

An assessment of local laboratory capacity for the diagnosis of relevant diseases is needed. Enhancements, including in logistics, should be budgeted for and implemented. Laboratories should be integrated into surveillance systems and plans and protocols put in place in advance.

### **3.5 Training and resources**

Identify training needs for staff well in advance. Consider awareness raising activities among local health care providers, particularly at primary and emergency centers. Participants stressed the overriding importance of competent and motivated staff in the success of any surveillance system.

Determine software and hardware requirements and consider the use of international health intelligence from sources such as the Global Public Health Intelligence Network (GPHIN), Promed and Medisis. Ensure systems are in place to disseminate and share data from other surveillance systems, such as environmental health, if the systems themselves cannot be integrated. Establish necessary communication channels and ensure these can be maintained for the duration of the MG.

Consider any legal and logistic issues associated with the presence of many different nationalities.

## **4. Case and casualty management**

### **4.1 Mass casualties – surge capacity**

Participants recommended that the relevant chapter within the Guidance Document be expanded to address the following needs for surge capacity in the event of mass casualties:

- knowledge of existing local infrastructure in order to respond
- co-ordination with law enforcement agencies
- location of temporary health care facilities near affected people in preference to transportation of patients to an established hospital
- interface between public health and health care needs
- resources and assets available (including military assets and private facilities)
- agreed definitions for casualties and agreed procedures for counting
- agreement on burden of costs.

Participants also highlighted the following issues of relevance to incidences of mass casualties:

- mass casualties can lead to mass migration – staff of foreign embassies are therefore essential partners
- some prioritization of individuals, such as heads of state, in response operations may be called for
- specific community groups such as street vendors, taxi drivers and NGOs can play essential roles
- strong, central command is essential for overall coordination and decision-making
- communication with local communities is essential following an incident of mass casualties
- authorities should anticipate and plan for likely offers of foreign assistance.

### **4.2 Psychological support**

Participants noted the importance of providing prompt psychological support which should be planned for and budgeted accordingly. Risk communication is also essential to allay fears and to communicate responsibilities, taking into account the different cultural and linguistic groups likely to be present. Experts in this field should be involved in planning and implementing such activities.

### **4.3 Mass dispensing**

Mass dispensing may be needed if large numbers of persons have been exposed to an agent and need a vaccine or medication quickly to prevent serious illness. In view of the large operational challenges associated with mass dispensing, participants stressed the following considerations:

- stockpiling
- accessibility, storage and transportation of vaccines
- training and exercises for various scenarios
- communication of needs and usage of mass prophylaxis
- up-to-date inventories of in-country stocks
- identification of at-risk population groups
- advanced agreements including Memoranda of Understanding (MOU) where necessary
- decision-making authority
- availability and funding for post-exposure prophylaxis.

### **4.4 Infection control – isolation and quarantine**

Advanced agreement should be reached on the use of isolation or quarantine. Availability of rooms for either isolation or quarantine (negative pressure rooms) must also be determined, and agreements put in place with NGOs and other organizations, such as national Red Cross or Red Crescent societies, that may have access to mobile isolation facilities. Patients should be removed voluntarily from the MG site. Isolation and quarantine operations require extensive advanced training and exercises. The IHR (2005) provide guidance on matters of isolation and quarantine.

### **4.5 Mass fatalities**

Planning should include potential needs in the event of mass fatalities, particularly if the event is due to a communicable disease or chemical exposure requiring decontamination. Coordination of activities and responsibilities will be essential. Funeral home directors are a valuable resource in meeting religious and cultural needs. Suitable locations for temporary morgues must be identified along with personnel to identify bodies. There will be legal aspects to consider surrounding forensic science and the release and repatriation of bodies in which embassies will play an essential role.

## **5. Disease control services**

### **5.1 Medical services**

It was recommended that the section on medical services in the Guidance Document be moved to come before that on mass casualties. Routine communication channels between medical and public health services may need to be strengthened. Responsibilities of medical services, logistics and medical staff on-call at venues must be agreed and disseminated. Coordination and rapid communication between different medical service providers, such as ambulance and first aid providers, will be essential for an efficient and prompt response. Any gaps in availability, surge capacity or funding should be identified and addressed well in advance, particularly if established medical services are likely to become overwhelmed.

## **5.2 Environmental monitoring: food and water safety**

Food safety relies on intensive and highly sensitive surveillance systems. These should ideally be fully integrated into communicable disease surveillance systems, but if this is not possible, coordination between the various systems will be necessary. Environmental health officers with experience and field expertise will be required.

Potential tensions caused by overlaps in mandates of various government agencies and departments should be identified and resolved in advance. The rapid, extensive and unpredictable turnover of food at MGs and in surrounding communities requires careful planning with local suppliers and distributors. Food inspection capacity must be increased accordingly.

Availability of large quantities of safe water is also essential. ‘Recreational’ water, used in air conditioning units, fountains etc, must also be uncontaminated. Hygiene facilities will need to be put in place close to temporary food distribution sites. Participants recommended that greater attention be given in the Guidance Document to sanitation and efficient waste management and disposal.

## **5.3 Health security and biological deliberate events**

If an outbreak of disease or environmental contamination at a MG occurs as a result of deliberate action, bioterrorism, it is likely that there will be rapid changes – in command, in priorities for investigation, in responsibilities, in access to information, or to sites and in public perception of the roles and responsibilities of government agencies. These should all be addressed well in advance of a MG.

Response to a deliberate event entails many of the procedures and activities involved in non-deliberate outbreaks, however, there are some significant differences. Symptoms are typically non-specific requiring specialized training for surveillance staff and innovative systems such as syndromic surveillance. Forensic investigations will have to work alongside the more immediate need for public health investigations. Valuable information should be shared as freely as possible among agencies. Direct experience in this area is rare and is largely dependent upon simulated training and tabletop exercises.

Division of responsibilities and prior agreement on respective jurisdiction among government agencies is essential. Communicable disease authorities may find their access to monitoring, coordinating and response facilities become limited, especially if high-level dignitaries become involved. They will also need to work closely with other agencies such as law enforcement and military intelligence. The burden of costs for sensitive laboratory testing relating to deliberate events should also be clarified in advance.

# **6. Command, control & coordination**

## **6.1 General**

The military term ‘command, control and coordination’ or C<sup>3</sup>, requires definition in the context of MGs and its value in the field of public health. C<sup>3</sup> can bring leadership and management skills to bear on complex operational situations. Command systems should be structured independently from the

personalities involved. They should, however, be flexible to allow people to fulfill various roles according to capacity and need. Communication must be standardized within and between agencies and there must be clarity of roles and responsibilities. Information technology (IT) plays a major role in an effective system.

Command systems should be set up, with simulation exercises, well in advance of an MG. Participants stressed the value in retaining experienced, trained staff in this area. Public health liaison officers may need to be seconded to other agencies. The command system should be linked on a 24 hour basis with the established lines of communication for designated National Focal Points of the countries concerned under the IHR (2005).

## **6.2 Planning and training**

Scenarios and table-top exercises are invaluable in understanding whether or not theory will work in practice. Training should include use of software, such as the Geographic Information System (GIS), reporting and alert systems, response procedures and familiarity with the area and venues in which the MG is taking place.

## **6.3 Logistics & security**

Participants suggested amendments to the chapter on logistics within the Guidance Document to avoid confusion with other chapters and to consider inclusion of IT requirements. The Guidance Document should also address handling offers of external support, whether unsolicited or with prior agreement.

# **7. Conclusion**

The workshop provided an opportunity for health professionals with direct operational experience and expertise in the area of public health response during MGs to share valuable knowledge and insights and to provide input to the draft Guidance Document.

The participants emphasized the importance of the work being undertaken by WHO in the area of mass gathering medicine and the value of the evidence-based guidance, advice and tools being developed by the WHO programme for Member States hosting MGs.

Some participants agreed to form an Editorial Board to support WHO in revising the draft Guidance Document and to ensure observations and recommendations from the workshop were incorporated in later drafts.

Other participants agreed to serve on a Virtual Inter-disciplinary Advisory Group for Mass Gatherings to guide the wider activities of the WHO programme in this area over the coming years.

The organizers would like to thank the participants for their time and valuable input in ensuring the final Guidance Document and related products provide Member States with the best available advice in preparing for and responding to threats to public health during mass gatherings.

## **Annex 1: Agenda**

### **Communicable disease alert and response for mass gatherings**

**Technical workshop, 29-30 April 2008**  
WHO Headquarters, Geneva, Switzerland

Chairs: Dr Agis Tsouros, Dr Andy Stergachis

#### **Day one:**

<b>09:00 – 09:20</b>	Opening session - welcome Introduction to EPR and the strategic relevance of MGs	Dr David Heymann Dr Mike Ryan Dr Agis Tsouros
<b>09:20 – 09:30</b>	Illustration of the workshop's expected output Working procedures and approval of the agenda	Dr Tim Healing
<b>09:30 – 10:30</b>	<b>About the MG draft document</b> Aim Applicability and scope <b>Key considerations</b> Legacy Integrated planning and response Considerations Outbreak management <b>Key sections</b> Critical components supporting communicable disease outbreaks	Dr Maurizio Barbeschi Dr Tim Healing
<b>10:30 – 10:45</b>	COFFEE BREAK	
<b>10:45 – 12:30</b>	<b>Risk assessment</b> Strategic risk assessment for the MG Risk assessment for the event/outbreak	Dr Jeremy McAnulty Dr Brian McCloskey
<b>12:30 – 13:30</b>	LUNCH	
<b>13:30 – 15:00</b>	<b>Communicable disease control</b> <b>Surveillance and epidemiology</b> Surveillance, alert and outbreak response International health intelligence Microbiology laboratories <b>Case and casualty management</b>	Dr Bonnie Henry Dr Ann Knebel

	Mass casualties and psychological support	Dr Jeff Duchin
	Mass prophylaxis	
	Infection control, isolation and quarantine	
	Large numbers of cases	
	Fatalities management	
	<b>Disease control services</b>	Dr Aaron Fleischauer
	Medical services and communicable disease control	Dr Jeremy McAnulty
	Food, water and environmental health	
<b>15:00 – 15:15</b>	TEA BREAK	
<b>15:15 – 18:00</b>	<b>Communicable disease control</b>	Dr Bonnie Henry
	Surveillance and epidemiology	Dr Ann Knebel
	Case and casualty management	Dr Jeffrey Duchin
	Disease control services	Dr Aaron Fleischauer
<b>18:00 – 19:00</b>	RECEPTION	
 <b>Day two</b>		
<b>09:00 – 09:45</b>	<b>Health security and biological deliberate events</b>	Ambassador Serguei Batsonov
<b>09:45 – 10:45</b>	<b>Command, control, coordination, social mobilization, health education</b>	Dr Ann Knebel
	<b>Command, control and coordination</b>	Mrs Susan Courage
	Command and control	Dr Brian McCloskey
	Multi-agency coordination	Dr Jeremy McAnulty
	Strategic health operations centres	
	External expertise	
	Risk communication and media	
	<b>Planning and training</b>	
	Preparedness and prevention	
	Training, education, and exercises	
	Health promotion	
	<b>Logistics and security</b>	
	Communications systems	
	Logistics	
	Security and law enforcement	
	Military	

**10:45 – 11:00** COFFEE BREAK

**11:00 – 12:00** **Command, control, coordination, social mobilization, health education**

(continued)

**12:00 – 13:30** **IHR, recommendations and closure**

Introduction to the IHR (2005) and MGs

Dr Guenael Rodier

Summary of the main recommendations

Dr Mike Ryan

Closure by the Chair

## **Annex 2: List of participants**

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## **Annex 3: Country experiences**

### **Risk assessment**

#### **The Hajj (Saudi Arabia)**

The following risk factors have been identified as prevalent during the Hajj, in Saudi Arabia:

- hair shaving, involving the possible re-use of blades
- close skin-to-skin contact between pilgrims
- extensive food markets
- high temperatures with the potential for heat stroke
- water supply, sewage and sanitation constraints with risk of disease transmission
- slaughtering of animals for sacrifice with associated potential for zoonotic infections in pilgrims
- long-distance transportation of personal food supplies without refrigeration.

#### **Beijing Olympic Games, 2008 (China)**

The Chinese authorities undertook an initial risk assessment for the 2008 Beijing Olympics in 2007 and will continue to update the assessment according to changing information and circumstances. It was decided that earlier risk assessments from previous Olympic Games were not relevant in the Beijing context.

#### **Iraq**

MGs held in Iraq for occasions in the Islamic calendar, pose particular challenges and attract pilgrims from many neighbouring countries such as Iran and Syria. Previously banned under the Saddam Hussein administration, the focus of the current Government of Iraq in MGs is the prevention of terrorism.

## **Surveillance and epidemiology**

#### **Turin Winter Olympic Games, 2006 (Italy)**

Syndromic surveillance was introduced for CDs, chemical events and possible poisoning. It was activated one month prior to the games and ran until one month after the event. There was close collaboration between the Ministry of Health and the regional authorities to facilitate the functioning of this system. The system was expanded to include two additional regions close to the area in which the games were taking place. Daily surveillance reports were sent to regional centres and to the coordination centre.

#### **Rome and mass gatherings related to the Holy See (Italy)**

Syndromic surveillance was established primarily for CDs but also for poisoning and possible deliberate use of infectious agents. The system involved first aid services, hospitals in Rome and district hospitals in neighbouring cities. Syndromic surveillance utilized an electronic system that connected relevant health establishments. A baseline was established ahead of time and daily and weekly reports were produced. The system also served as a trigger to investigate clusters.

#### **Athens Olympic Games, 2004 (Greece)**

The existing routine surveillance system was up-graded, moving from a passive to a 'semi-active' system. Normal monthly reporting was increased to weekly, and then daily reporting during games. A key objective of the system was the capacity to detect bioterrorism-related events. A list of diseases was agreed upon before the games and focal points for surveillance were identified in each designated hospital. Syndromic surveillance was also introduced, particularly in light of the threat of deliberate events. The value of this type of surveillance remains controversial, especially regarding the trade-off between high sensitivity and low specificity, and the absence of a baseline. Syndromic surveillance activities consumed two thirds of the total resources available for surveillance activities.

#### **China**

China holds several mass gatherings yearly and has many parallel surveillance systems in place, such as a public health events reporting system in schools, factories and pharmacies. Surveillance was enhanced for the Beijing Olympics and included syndromic surveillance as well as surveillance for specific diseases.

#### **FIFA Football World Cup, 2006 (Germany)**

Existing surveillance systems were enhanced as required. Standard weekly reporting was increased to daily data transmission one month prior until one month after the World Cup. A comprehensive list of diseases to be routinely reported, including mandatory 'zero' reporting, was drawn up with an additional field to enable physicians to report other diseases of relevance or suspicious syndromes. Additional surveillance by media scanning for key words was undertaken by a private company, analysis of which was very labour-intensive, with one person dedicated to this throughout the surveillance period.

#### **Catholic World Youth Day, 2002 (Canada)**

Surveillance personnel were embedded into medical centres designated for the World Youth Day to collect surveillance data and report to a central epidemiological centre.

## **Case and casualty management**

#### **Catholic World Youth Day, 2002 (Canada)**

The primary morbidity burden was heat-related illness. A rehydration ward was established on-site (300 beds) and most cases were managed on-site. The role of the ambulance service proved crucial. A medical director for World Youth Day was in post two years ahead of the MG. An effective surveillance system detected early onset of cases and initiated a rapid and successful response. Lines of communication and collaboration between emergency medical services and volunteer medical staff on-site had been established beforehand. Surge capacity was planned for and volunteers on standby were brought in when required.

### **Athens Olympic Games, 2004 (Greece)**

Case management inside and outside the official zones varied substantially and should be planned separately, the interface being the ambulance system. Designated hospitals were essential and were up-graded and tested accordingly. Medical needs for teams and athletes were complicated and varied according to each individual country's requirements and resources. Supporting countries and organizations identified resources that could be mobilized if mass casualties arose, such as backup hospitals, and drew on military and private sector facilities.

A hospital for quarantine was identified but kept secret. There were many logisticians on-site who trained to manage a quarantine operation if needed. A central, top-down, coordinating body was in place in Athens which proved effective. A central information control centre was established to coordinate health care. There was an expectation that information would be shared with the global community.

### **The Hajj (Saudi Arabia)**

A number of hospitals are set up specifically for the duration of the Hajj. The costs of all medical care during the Hajj are covered by Saudi Arabian authorities.

## **Disease control services**

### **The Hajj (Saudi Arabia)**

Food safety is always a major challenge during the Hajj, where meals are provided for 2-3 million pilgrims. In previous years there were regular outbreaks of food poisoning, often related to the delayed serving of food after cooking, as temperatures were difficult to maintain. This has not been the case in recent years. Eateries such as Kentucky Fried Chicken have been invited to serve fast food. Cholera outbreaks have occurred in the past but are now rare.

### **Washington DC (USA)**

Environmental health colleagues have a strong field presence and are a valuable sentinel surveillance source. Responsibilities are complicated and overlapping, posing challenges for communication flows. Food inspection and accreditation of food providers is done at the local level, but regulation is at the federal level. Activities are only integrated at the command and control level, supported by a joint information centre for daily sharing of information from different agencies.

### **Catholic World Youth Day, 2002 (Canada)**

Food was provided for pilgrims on-site. Environmental health and CD surveillance systems were well integrated. A food library was set up that kept samples of all food served for testing when problems were identified.

### **Sydney Olympic Games, 2000 (Australia)**

Preparation for the Olympic Games in Sydney started years in advance, with sampling for water and food as quality assurance leading up to games. During the games, there was a strong inspection presence, as sampling is difficult and results are often delayed.

### **Athens Olympic Games, 2004 (Greece)**

Food safety was planned well in advance. Overlapping jurisdictions for food safety and water and sanitation needed clarification, including laws, remits and responsibilities (e.g. local level, national level). Training and standardization of protocols were essential – many different protocols existed as many people were brought in from other areas of the country to help. Data were sent through to the Olympic environmental unit online. There was no direct operational link between environmental health and CD surveillance – they were linked at the level of the command and control centre. Joint investigation teams were on standby, but these were not required. Cruise ships serving as floating hotels were a particular challenge in terms of monitoring food and water safety. The level of compliance was generally high and increased during the games. Spectators were not allowed to bring their own food and beverages into the venues – this provided an added level of control.

### **Beijing Olympic Games, 2008 (China)**

Air quality monitoring was a major issue leading up to the Beijing Olympics. Food safety monitoring was coordinated between the Government and Olympic Committee.

### **Vancouver Winter Olympic Games, 2010 (Canada)**

Environmental health monitoring of cruise ships will be significantly increased in advance of the games. Federal environmental health personnel will monitor air quality. The Canadian Network for Public Health Intelligence (CNPHI) will be linked with environmental health and quarantine facilities.

## **Health security and biological deliberate events**

### **Athens Olympic Games, 2004 (Greece)**

There was a pervasive believe that 'anything could happen' which had to be managed. As a result, the level of resources invested in preparation for deliberate events was disproportionately higher than resources available for other areas. A lot of resources were invested in exercises. There was a significant need for support and cooperation from international counterparts, especially related to clinical training in recognizing BT-related symptoms.

### **The Hajj (Saudi Arabia)**

There is planned coordination with military in the event of anthrax contamination. A smallpox vaccine stockpile has also been put in place.

### **Sydney Olympic Games, 2000 (Australia)**

Communicable diseases were considered by the high-level security committee. Stockpiles of counter-measures for chemical, biological and radio-nuclear agents (CBRN) were put in place. Medical staff received extensive training in BT-related symptoms. An automated emergency room reporting system was established for potential syndromes associated with CBRN.

### **Catholic World Youth Day, 2002 (Canada)**

Public health was brought into the joint intelligence centre for first time for this MG. Several simulation exercises took place. The experience revealed reticence on the part of the police and security services to share information with the media and general public.

### **United States**

There is increasing collaboration between public health and law enforcement agencies in exercises, dialogue and epidemiological investigations. Fifteen national planning scenarios exist in the US covering most aspects of response.

### **Turin Winter Olympic Games, 2006 (Italy)**

Communication was through the Ministry of Health with one authorized spokesperson. Spokespeople for each area should be clearly identified in emergency plans.

## **Command, control and coordination**

### **United States**

At the time of the anthrax incidents in the US in 2001, there was no central command, control and coordination within the Department of Health and Human Services (HHS). There is now a focal point for coordination although it is still sometimes unclear who has the lead among the Centers for Disease Control and Prevention (CDC), the Food and Drug Administration (FDA), and the Food & Agricultural Agency. HHS coordinates if more than one agency is involved. The US now has a well-established incident command system (ICS) with defined roles and responsibilities at all levels of government. Each level has its own ICS that provides channels of communication during an event. There are innovative web based tools in use at the local level for sharing information among public health staff during an event. This can be adapted for national MGs.

### **Australia**

Coordination is mostly at state level via a cross-government overarching committee with national level coordination for multi-state events. The state-wide committee is informed even if the public health authorities are leading an investigation to ensure that other agencies and areas of government are in the loop. The focus is chiefly emergencies and fire incidents, rather than public health events and although the structure is not designed for public health needs it facilitates communications between different areas of government.

### **Italy**

National events are coordinated within the emergency operations centre of the Civic Protection Department. The public health response is coordinated by the Ministry of Health. Regular planning and exercises are coordinated by the Ministry of Interior, testing capabilities for communication and response.

### **FIFA Football World Cup, 2006 (Germany)**

The Ministry of Interior (MofI) coordinates all such events with a parallel crisis room in place at the Robert Koch Institute (RKI). During the World Cup, local health authorities fed information into the RKI system, which collated national and international medical intelligence for the MofI. Establishing the lead for the coordination of outbreaks is complicated, as states have responsibility for management of outbreaks (states can ask national level for support, and national level can only be active if asked for support). As requests for help may be delayed, RKI is sometimes active in requesting the invitation at the national level while, respecting the autonomy of states.

### **Athens Olympic Games, 2004 (Greece)**

Command and control is one of the biggest legacies of the games – it is now the heart of the health system. At the time, it was a totally new concept in terms of how to coordinate the health sector. Athens was an exceptional situation in terms of command and control. Heads of national agencies, such as the Hellenic Centre for Infectious Diseases, were part of central command and control, and each agency had its own command and control system. One point of contention existed between the civic protection centre (with a health component) and the police who have responsibility for ‘activating the alarm’ in the case of a deliberate event. An online/real-time system monitored hospital assets.

### **Saudi Arabia**

Command and control is situated within the Ministry of Health. Centrally coordinated committees have been established that bring together the different areas of government (health, agriculture etc). At the regional level, committees are established under the coordination of the surveillance unit (hospitals, labs etc.). Regular routine meetings and exercises, such as for pandemic influenza, are held under the coordination of the military.

### **Canada**

Canada has an existing culture of command and control. Provinces are only supported upon request. National level coordination for health event response is coordinated by the Public Health Agency of Canada (PHAC). The Canadian Food Inspection Agency (CFIA) is involved when appropriate. A CBRN event would be coordinated by Public Safety Canada. Training is provided on the system itself and on the procedures for switching to this system from routine daily work, including working under different supervision, adapting to new roles and rapid decision-making.

### **UK**

Roles and responsibilities are defined well in advance. The UK has a Gold/Silver/Bronze (Strategic/tactical and operational) structure across health, police, fire and ambulance response structures. Public health is embedded at each level during an incident. The lead agency is identified according to the nature of the incident. An incident leader is identified with training and competence in incident direction, but not necessarily in the specific context. The experience of the UK is that concepts and procedures are more important than technology and that communication plays a central and essential role.

## **Planning and training**

### **Saudi Arabia**

Regular training takes place in collaboration with WHO/CDC. National training is carried out yearly for public health officials and medical services. Regional capacity building and training is on-going.

### **Canada**

The Molson Indy motor race was used as an opportunity to test the systems in advance of Catholic World Youth Day in 2002.

### **Caribbean**

The opening day ceremony of the 2007 Cricket World Cup in Grenada was used as an opportunity to test the system. Each health station on the island trained on the procedures and how to engage stakeholders.

### **Vancouver Winter Olympic Games, 2010 (Canada)**

Front line training has been provided for federal quarantine officers. Education sessions have been provided for front line public health staff at local and regional levels.

### **Athens Olympic Games, 2004 (Greece)**

Training facilitated the development of links between different areas of the administration. There was extensive training for CD control staff and good connections were established with several partners, such as the European Programme for Intervention Epidemiology Training (EPIET).