

Global mass gatherings: implications and opportunities for global health security

Report by the Secretariat

1. Mass gatherings have significant implications for public health beyond the acute public health events which may occur and require rapid detection and effective management. These implications extend to the benefits of cross-sectoral preparedness planning and increased capacity in the health infrastructure; the international spread of epidemic or pandemic disease; or the powerful leverage that public awareness and interest in such events present for communication of information. Mass gatherings represent risks to health security, with the potential to directly endanger the health of populations, to raise levels of social anxiety, political urgency and to cause economic disruption on a local, regional or global scale. The many challenges posed by mass gatherings have stimulated research and debate.¹

2. This report outlines the implications of such gatherings for public health security, the resources available, and the potential opportunities for strengthening health systems. WHO's existing and potential contribution to the planning and preparedness for such events is described, including pre-emptive and preventive measures, as well as the global response mechanisms for disease outbreaks in place. This report also suggests improvements for public health systems, including the coordination and interdisciplinary approaches required to address the range of public health risks posed by international mass gatherings.²

THE CURRENT SITUATION

3. The public health implications of mass gatherings are becoming more pronounced, as such events draw ever-larger international crowds. Data collected during the hajj show that the proportion of international pilgrims increased by almost 30% between 1996 and 2006.³ Attendance at the London

¹ A number of academic and research institutions have produced material recently on mass gatherings, such as Flinders University in Australia, the University of Washington and the Centers for Disease Control and Prevention in the United States of America, and Umm Al-Qura University in Saudi Arabia. In addition, important academic conferences, such as The Lancet Conference on Mass Gatherings Medicine, hosted by the Kingdom of Saudi Arabia, have led to policy guidance such as the Jeddah Declaration on Mass Gatherings Health.

² See also *Weekly Epidemiological Record*, 2011, **86**(39):425–428.

³ Official data from the Ministry of Hajj, Kingdom of Saudi Arabia, <http://www.hajjinformation.com/main/1.htm> (accessed 28 November 2011).

Olympic Games in 2012 is expected to be some seven million. These events offer valuable opportunities for public health actions, as unprecedented attention and resources are focused for a brief, but intense, period of time on health systems in host communities and nations. However, alongside their potential positive impact, mass gathering events also have the potential to strain the health resources of host communities, and to import and export infectious diseases as international participants arrive and depart.

4. Urgent, complex health and social situations can result from mass gatherings, influenced by the purpose of the mass gathering, the demographics and external factors. Public health risks can increase from close contact in crowded venues and accommodation, and extreme climatic conditions. Temperature-related illness and dehydration are common causes of illness during mass gathering events (cases of heatstroke, for example). Familiar disease problems may be amplified and increase the demands placed on local health services during an event: researchers undertaking a prospective study in two hospitals during the hajj identified respiratory disease as the most common cause (57%) of admission to hospital, with pneumonia being the leading reason for admission in 39% of all patients. Outbreaks of respiratory disease were also reported at the 2002 Winter Olympics in Salt Lake City, and cases of pandemic (H1N1) 2009 influenza were reported in music festivals across Europe in that year. Unexpected disease transmission may occur and may cause outbreaks beyond the immediate venue; in 2000 and 2001, in association with the hajj, there was an international outbreak of disease caused by a previously rare strain of *Neisseria meningitidis*, serogroup W135.

5. Few studies are available on how to prepare for and manage public health risks at such gatherings; resource materials available for planning purposes are limited. However, the transfer of expertise between organizers and hosts of mass gatherings across the globe is increasing. In October 2010, The Lancet Conference on Mass Gatherings Medicine was hosted by the Kingdom of Saudi Arabia. This was an important step and led to the Jeddah Declaration on Mass Gatherings Health. The Declaration stresses the importance of providing comprehensive and safe health care at mass gatherings. In 2011, WHO designated the United Kingdom Health Protection Agency as a Collaborating Centre on Mass Gatherings and High Visibility/High Consequence Events.

6. Bodies such as the International Olympic Committee or the Fédération Internationale de Football Association have a key role in facilitating public health preparedness and response, health promotion and health legacy, by imposing public health planning requirements for host nations. WHO has signed a Memorandum of Understanding with the International Olympic Committee and the Bureau International des Expositions. WHO has also worked closely with several national governments in preparing health authorities for international mass gatherings, such as the Olympic Games (e.g. Athens 2004, Beijing 2008, Vancouver 2010 and London 2012), 2010 FIFA World Cup (South Africa), 2010 Shanghai World EXPO, and many other events.

PLANNING AND PREPAREDNESS

7. Preparedness for mass gatherings includes specific public health measures developed in advance of the event, training for their implementation, as well as planning for improvements in the hosting nation's health systems.¹ Because of its size and features, the Glastonbury Festival of Contemporary Performing Arts in the United Kingdom, for example, recently served as a model and exercise ground

¹ Report on WHO support to the 2010 FIFA World Cup South Africa™. January 2011, <http://www.afro.who.int/en/south-africa/south-africa-publications.html> (accessed 28 November 2011).

for field-testing epidemiological assessments in highly crowded environments. Such planning includes:

- *Emergency medical services and hospitals.* Plans for the management of mass casualties or mass fatalities and preparedness for emergencies¹ at the community level, as well as at event venues and related locations (e.g. “fan zones”).
- *Infection control.* Best practice and correct standards for infection control should be ensured, including outbreak management, vaccinations, isolation and other measures that may be required.
- *Laboratory capacity.* Preparedness for surge capacity includes ensuring adequate diagnostic capacities (human resources and reagents, transport procedures from unusual sites).
- *Travel medicine.* Procedures to provide updated health advice and vaccination guidance for visitors. WHO’s publication on mass gatherings, *International travel and health*, will be expanded in forthcoming editions. The Organization may also increase awareness-raising for specific events.
- *Points of entry strengthening.* The ability of port health services to detect disease among attendees.
- *Health promotion.* Promotion of healthy behaviours in relation to the event, such as increased physical activity, cessation of tobacco use and avoidance of excess alcohol.

8. Mass gatherings often generate political momentum and resources, and present an important opportunity to improve health systems, minimize health risks and promote healthy behaviours. Mass gatherings may be discrete or recurrent, but the impact of public health measures can be sustainable. Careful planning and preparation is needed to increase the long-term positive impact.

9. Ideally, any enhancements to a health system should be sustainable. Through strengthening the core functional capacities of Member States, planning for mass gatherings may also facilitate the implementation of the International Health Regulations (2005).

Risk assessment and reduction

10. The International Health Regulations (2005) can also be used as a framework on which to build further capacity. Reducing public health risks associated with mass gatherings requires a planning and management approach that coordinates across sectors and strengthens partnerships. Preparing public health systems and medical services is a complex process that should begin well in advance to identify potential risks and ensure capacities to prevent, minimize and respond to public health emergencies. An all-hazard approach to public health risks is generally recommended by WHO.

11. **Types of risk assessment.** Risk assessment processes for mass gatherings include a *strategic* risk assessment, and an *event-based* risk assessment.

¹ A hospital emergency response checklist for hospital administrators and emergency managers has been prepared by the WHO Regional Office for Europe, see <http://www.euro.who.int/en/what-we-do/health-topics/emergencies/disaster-preparedness-and-response/publications/2011/hospital-emergency-response-checklist> (accessed 28 November 2011).

12. Strategic risk assessment is conducted by the organizing country throughout the cycle of event planning and operations and includes the identification of hazards that could pose a risk to the mass gathering, assessment of their likelihood of occurring, and assessment of their potential impact.

13. Event-based risk assessment is a process that should include an enhanced surveillance and outbreak alert and response mechanism:

(a) *Enhanced surveillance*: Disease surveillance systems should be enhanced to quickly detect and communicate information related to diseases and health events among participants.

(b) *Outbreak alert and response*: An adequate existing local infrastructure enhanced to address the pressures introduced by the mass gathering is crucial to the ability to respond and implement timely infection-control activities.

14. **Command, control and communication.** The heightened visibility and involvement of many sectors in mass gatherings require a robust and flexible command and control structure with the clear allocation of roles and responsibilities, decision-making protocols and predefined communication strategies. Public health and emergency services are essential players within this system; both need to work together to respond to the ad hoc requirements of mass gatherings.

DISEASE TRANSMISSION

15. Introduction, amplification and transmission of diseases during an event, as well as the importation/exportation of diseases more widely after an event, represent serious risks to public health. An example of this arose at the 2010 FIFA World Cup in South Africa. A mass vaccination campaign for measles had taken place in the host country, in preparation for the sporting event; however, measles cases occurred as a result of imported cases of a European strain.

16. Two of the most important factors at mass gatherings that contribute to the enhanced transmission of communicable disease are high crowd density and increased population mobility. Other factors include poorly handled mass catering and inadequate sanitation. The detection of disease outbreaks, as well as public health measures to manage them, are further complicated by the increased demand on medical services and by the short duration of stay of many participants.

17. A significant strain on host communities is often the need to handle diseases and injuries related to the event while maintaining normal services for local communities. In addition, there is a danger that local health needs may displace the longer-term international consequences for public health security of infections arising through close crowd contact.

18. A number of scientific studies conducted around World Youth Day 2008 in Sydney, Australia, found that overseas attendees to Australia introduced influenza during a non-seasonal period. The influenza outbreak, with over 100 laboratory-confirmed cases, was exacerbated by accommodation conditions (i.e. crowding) and may have affected seasonal influenza patterns in Australia and in several countries of origin of the participants.

19. Disease outbreaks have also been associated with contaminated water and food at mass gatherings; for example in 1997, *Escherichia coli* O157 was transmitted through cattle faeces in contaminated mud at the Glastonbury arts festival. An outbreak of leptospirosis was reported among triathlon athletes in 1998 in Springfield, Illinois, where 11% of tested participants had laboratory

results which were positive for leptospirosis. It is likely that this large outbreak arose from ingestion of contaminated lake water. The safe preparation of food and drink, appropriate storage and distribution, and tracking of food origin in an acceptable time frame require expertise, planning, oversight, enforcement, infrastructure and resources, as does monitoring of water safety. For example, the organizers of the Athens Olympic Games in 2004 developed a scoring system for inspecting water systems to prevent outbreaks of legionellosis.

PUBLIC AWARENESS

20. Not only do mass gatherings draw together unusually large concentrations of people, presenting local opportunities for dissemination of information, they also offer potential extended access to more distant populations through the involvement of mass media and social networking. The televised 2008 Beijing Olympic Games and the 2010 FIFA World Cup in South Africa were the most watched events of their sort ever. An estimated 4700 million viewers followed the 2008 Olympic Games.¹ This has obvious implications for the dissemination of promotional messages or information with either positive or negative health impacts.

21. The hosting of the Olympic Games raises the profile of the positive medium- and longer-term effects of public health initiatives. Health promotion and awareness campaigns can be galvanized by the high-profile nature of mass gatherings but they can also, along with other health interventions, be formalized through the requirements for potential host bidding documents. For example, the International Olympic Committee has recently included a section on health legacy in its technical manual on medical services.

22. Health promotion campaigns can be used to reinforce healthy behaviours during and after the event. Examples include food safety initiatives and tobacco control measures, including cessation services. Interventions to prevent interpersonal violence and campaigns against alcohol abuse can also benefit from heightened visibility and media attention. The 2003 WHO Framework Convention on Tobacco Control also provides a legal platform for tobacco control.²

EXISTING WHO RESOURCES TO SUPPORT PLANNING AND CONDUCT OF MASS GATHERINGS

23. In addition to the provision of specific risk-based support to those involved in the planning of mass gatherings, WHO has a number of initiatives and tools in place for developing and propagating knowledge based on experience of mass gatherings, including the following:

- The Virtual Interdisciplinary Advisory Group on mass gatherings is maintained by WHO to generate evidence-based knowledge of mass gatherings and can be deployed in response to the needs of hosts and organizing bodies.

¹ *The health legacy of the 2008 Beijing Olympic games: successes and recommendations*. World Health Organization, Manila, 2010.

² Technical guidance is available on tobacco control measures at mass gatherings, see *A Guide to Tobacco-Free Mega Events*, WHO Regional Office for the Western Pacific, Manila, 2010.

- WHO's training programme on mass gatherings ensures that ad hoc support is provided on demand to Member States and organizing bodies, thereby raising awareness and building global capacity to respond effectively to public health emergencies during mass gatherings.
- WHO's Observer Programme facilitates the training and placement of international observers at current events by organizations that will be hosting events in the future. This programme was created explicitly to start a culture of event-to-event transfer of expertise.
- WHO is collaborating with the United Kingdom Health Protection Agency on a web-based mass gatherings planning and assessment tool to make it easier for hosts to assess their readiness for mass gatherings.
- The WHO Interdepartmental Mass Gatherings Group is a source for countries of WHO expertise and provision of guidance on elements of health-system preparedness, health promotion and capacity-building to implement the International Health Regulations (2005).

ACTION BY THE EXECUTIVE BOARD

24. The Board is invited to note the report.

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