World Health Organization

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Declaration of Interest (DOI) for external contributors

All external contributors submitted to WHO a declaration of interest disclosing potential conflicts of interest that might affect, or might reasonably be perceived to affect, their objectivity and independence in relation to the subject matter of the document. WHO reviewed each of the declarations and concluded that none could give rise to a potential or reasonably perceived conflict of interest related to the subjects covered by the document.

Abbreviations

AAR	After action review
EndEx	End of the simulation exercise
EPRP	Emergency Preparedness and Response Plan
IHR	International Health Regulations (2005)
MG	Mass gathering
RCCE	Risk communication and community engagement
SOPs	Standard operating procedures
SimEx	Simulation exercise
WHO	World Health Organization

Introduction

Mass gatherings (MGs) are characterized by large numbers of people congregating at a specific location for a specific purpose over a set period of time, an event which has the potential to strain the planning and response resources of the host country or community. MGs include various types of events, and may be of a sporting, cultural, religious, entertainment, business or political nature. They can range from local to global in scale, and vary in their regularity and duration. While MGs offer potential benefits to host communities, they can also pose public health risks such as infectious disease outbreaks, crowd surges, environmental health threats and others. Effective management of MGs requires comprehensive planning and preparedness, which includes recognizing and mitigating health risks and ensuring robust public health and emergency response systems.

WHO's publication, *Public health for mass gatherings: key considerations (1)*, along with core guidance documents on simulation exercises *(2)* and core guidance on conducting after action review *(3)* and their related tools – which this document aims to complement – provide support for host countries and event organizers. These resources aim to enhance preparedness for MGs by promoting strong coordination among various stakeholders, improving communication, and bolstering public health infrastructures and emergency responses. Ultimately, well-managed MGs not only address immediate health risks but also contribute to lasting benefits for the host communities, such as stronger health systems, a skilled health workforce, an improved public infrastructure, and resilient and well-informed communities.

Purpose and scope

The mass gathering practical guide for simulation exercises (SimEx) and after action reviews (AAR) has been developed through a detailed, consultative process that involved several steps to gather, refine, and organize the essential information, tools, and best practices included here.

The primary purpose of this mass gathering practical guide is to equip host countries, event organizers, health authorities, and other relevant stakeholders with tools to test their preparedness for managing MG events. It is designed to complement *The Generic All-Hazards Risk Assessment Tool for Mass Gathering Events*, supporting comprehensive health planning specific to mass gatherings. By using this guide, public health authorities, event organizers, and stakeholders can better safeguard the health and safety of attendees and host communities.

To facilitate preparedness, the guide includes four hazard-specific scenario examples —covering foodborne outbreaks, crowd surges, chemical spills, and heatwaves—which can be adapted to suit local and event-specific contexts. These scenarios are structured to test the effectiveness of existing plans and assess stakeholders' familiarity with response protocols, particularly for government and policy-making audiences.

For post-event, the guide also provides a comprehensive AAR question database, organized by pillars and cross-cutting themes, to assist in facilitating MG-specific AARs.

Intended audience

MG simulation exercises (SimEx) and AAR tools included in this practical guide are constructed on the established SimEx and AAR methodology, and adopt a multisectoral and all-hazard approach. The potential use of these tools is set out in subsequent chapters; additional resources can also be accessed in Annex 1 and Annex 2. The intended audience includes host countries, event organizers, health authorities and other relevant stakeholders.

Methods description

Phase 1: Context assessment and defining needs

Consultations were conducted via Microsoft Teams for 45 minutes, with key partners, including Regional MG Focal Points, WHO Mass Gathering Collaborating Centres and event organizers experienced in hosting MG events. These engagements assessed existing technical tools, identified gaps, and proposed additional resources to enhance preparedness and response. A literature review of both peer-reviewed and grey literature was also undertaken, focusing on Simulation Exercises (SimEx), After Action Reviews (AAR), and Intra-Action Reviews (IAR) within the MG context. Additionally, a mapping exercise was performed to categorize the unique characteristics and needs of various MG events, outlining how these translate into customized SimEx/AAR planning and execution.

Phase 2: Development of the mass gathering SimEx/AAR toolkit

Findings from Phase 1 informed the design of operational tools. Existing WHO Simulation Exercises and Action Reviews resources were tailored to address the specific needs of MG events. Tools were revised and updated where gaps were identified, resulting in an integrated and comprehensive SimEx/AAR toolkit specifically for the MG context. This systematic approach ensured that the practical guide is evidence-based, contextually relevant, and aligns with the operational needs of diverse mass gatherings.

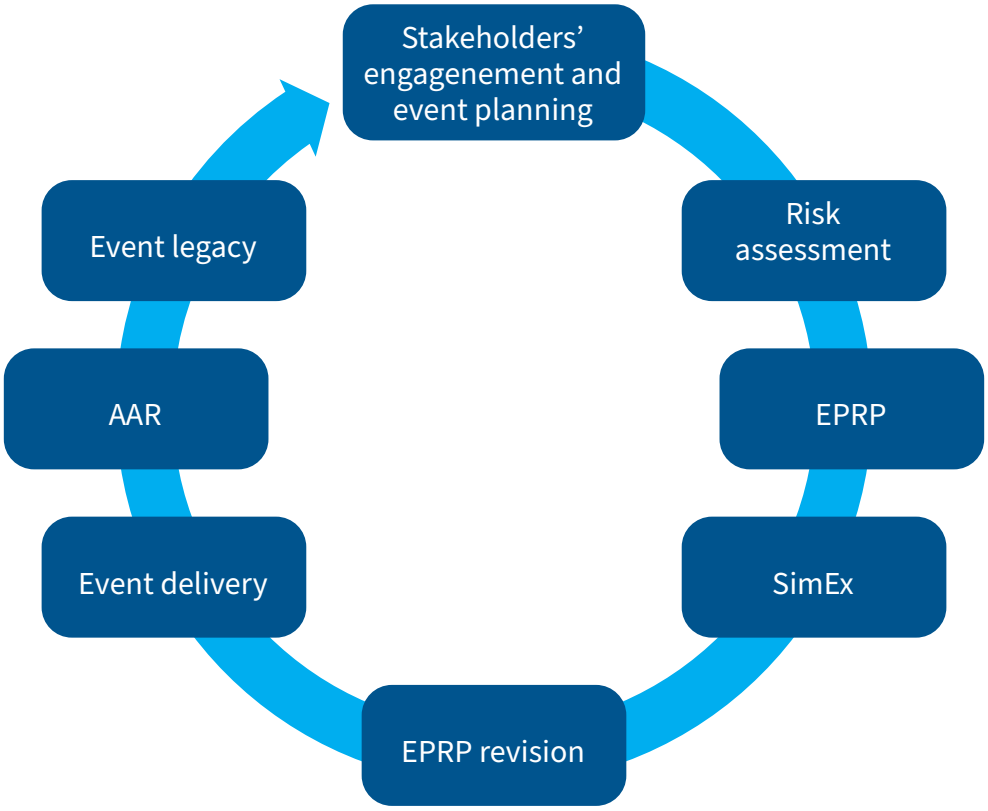
Chapter 1. Mass gathering preparedness

Planning and preparing for MGs should adopt a holistic approach and include stakeholders across multiple sectors: these may vary depending on the type and purpose of the gathering but typically include event organizers, health authorities, local government and other governmental bodies such as the Ministry of the Interior, Ministry of Tourism and Ministry of Sports, international organizations such as WHO, law enforcement and security agencies, planning, finance sectors, vendors and suppliers, community or religious groups and organizations, public transportation services, and public or private experts in MG management.

Control Center during SimEx, Photo Credit: © WHO / Pierre Berendes

Mass gathering preparedness involves multiple cyclical steps as laid out below and in Fig. 1. This cycle diagram is based on *Public health for mass gatherings: key considerations (1)* and incorporates SimEx and AAR into the preparedness cycle for mass gatherings. Advocacy and legacy initiatives along with AAR findings should contribute to future MG preparedness and ensure that such events are as safe as possible, advancing from previous lessons learned. Additionally, learning from previous events should be widely disseminated so that this knowledge is more widely integrated into countries' preparedness strategies.

Fig. 1: Mass gathering preparedness cycle



AAR: After action review
EPRP: Event Emergency Preparedness and Response Plan
SimEx: Simulation exercise
Photo Credit: © WHO

The mass gathering preparedness cycle includes the eight components listed below.

- **Stakeholder engagement and event planning:** identify and engage all relevant stakeholders in the MG preparedness process to agree on their activities based on the purpose of the event including clear roles and responsibilities, scope and objectives of the preparedness process, modalities of work, communication channels and funding.
- **Risk assessment:** conduct an all-hazards risk assessment which should be systematically updated throughout the event to identify relevant public health risks and prioritize both perceived risks as well as mitigation measures to manage them effectively. While a risk assessment should be performed early in the MG preparedness process, it should also be regularly updated – owing to the evolving nature of risks – as response plans are modified and further information comes to light.
- **Event Emergency Preparedness and Response Plan (EPRP):** develop and share with involved multisectoral stakeholders the plan and standard operating procedures (SOPs) which should address public health risks identified through the risk assessment process. The plan should be updated based on the evolving risk and country coping capacity.
- **Simulation exercises:** conduct simulation exercises to test the likely event scenarios for mass gatherings, EPRP and SOPs, to identify strengths and challenges in MG preparedness and to familiarize

stakeholders with event plans and their functional roles and responsibilities. (More information on planning for and conducting SimEx for MGs is provided in Chapter 2. For more general SimEx advice, refer to the *WHO Simulation Exercise Manual*, 2017 *(2)*).

- **EPRP revision:** based on SimEx findings.
- **Event delivery:** in the MG event delivery phase, while continuously monitoring the risks, implement and update the event EPRP and SOPs and adjust plans as necessary.
- **After action review**: conduct a review within three months of MG event closure to identify best practices, challenges and lessons learned: this is also important for generating event legacy and updating plans and SOPs for further mass gatherings. (More information on planning and conducting AAR for MG is provided in Chapter 3. For more general AAR advice, refer to *WHO Guidance for AAR*, 2019 *(3)*).
- **Event legacy**: insights from MG planning and delivery, including those highlighted in the SimEx and AAR, can help to strengthen health systems, workforce capacity and public infrastructure resilience. Early integration of health legacy planning with allocated resources, agreed evaluation criteria and a structured sharing process for findings is crucial. Regular reviews of lessons learned as well as legacy documentation are vital to assess policies and enhance best practices. Host authorities and event organizers should seize these opportunities to improve their processes and share knowledge with future event stakeholders.

The Hajj pilgrimage, Photo Credit: © WHO

Risk assessment considerations

In the context of MGs, all-hazards risk assessment is a valuable strategic process to identify relevant hazards and crucial for event planning and preparedness such as developing mitigation measures and a risk communication and community engagement strategy for the event. It also helps in understanding the host country's context and needs for the event, including its health system capacities and available resources. Conducting a risk assessment is a fundamental element to inform planning, because MG contingency plans rely on the findings of this assessment. This process should start early in the MG preparedness cycle and be repeated throughout the period leading up to the event, and continue during the event itself *(4,6–8)* like sporting events or religious pilgrimages, are highly visible events attended by tens of thousands of people. They can pose public health risks and strain the public health resources of the hosting community, city or country. Mass gatherings, like the Olympics or Hajj, require considerable preparedness and response capabilities on the part of the host *(1)*. Mass gatherings of people at religious pilgrimages and sporting events are linked to numerous health hazards, including the transmission of infectious diseases, physical injuries, and an impact on local and global health systems and services. As with other forms of disaster, mass gathering-related disasters are the product of the management of different hazards, levels of exposure, and vulnerability of the population and environment, and require comprehensive risk management that looks beyond single hazards and response. Incorporating an all-hazard, prevention-driven, evidence-based approach that is multisectoral and multidisciplinary is strongly advocated by the Sendai Framework for Disaster Risk Reduction 2015-2030. This paper reviews some of the broader impacts of mass gatherings, the opportunity for concerted action across policy sectors and scientific disciplines offered by the year 2015 (including through the Sendai Framework). To strengthen the planning and preparedness phase of a mass gathering, WHO offers some tools, including *The generic all-hazards risk assessment tool for mass gathering events (4)*.

WHO recommends that the decision-making process regarding mass gatherings (e.g. postponement, cancellation or modification of events) should adopt a risk-based approach and involve relevant authorities in consultation with event organizers. This process should be inclusive, transparent and open to all relevant stakeholders *(2,8)*.

The WHO risk-based approach involves three steps *(4,8)*:

1. **risk evaluation:** identifying and quantifying baseline risks associated with the mass gathering;
2. **risk mitigation:** applying a series of precautionary measures aimed at reducing the baseline risk; and
3. **risk communication:** proactively disseminating information about the adopted precautionary measures, their rationale and purpose, and the decision-making process.

Results from risk assessment should inform the development of SimEx and AAR activities for mass gatherings. As illustrated in Fig. 1, both activities may thereafter contribute to update of the risk assessment. These activities provide useful ways for stakeholders to address gaps and challenges, and implement lessons identified throughout the MG preparedness and evaluation phases to improve the safety of mass gatherings, both current and future *(1–4)*.

Chapter 2. Mass gathering simulation exercises

Overview

Simulation exercises (SimEx) form a core part of preparedness efforts to test the preparedness capacity of health system, identify weaknesses in existing emergency plans, reveal resource gaps, facilitate and improve staff coordination, and clarify and practice roles and responsibilities. Simulation exercises are also key tools to improve mass gathering preparedness and delivery by testing and evaluating extant emergency plans and SOPs for a mass gathering event *(1,9)*. SimEx are particularly valuable for mass gathering readiness due to the unique nature of MG events compared to routine, everyday operations of the health system. A mutual understanding of MG context, additional medical services dedicated to the MG and the standard public health response is crucial.

There are various types of SimEx but they can be separated into two fundamental categories: discussion-based exercises (tabletop exercises) and operations-based exercises (drills, functional exercises and full-scale or field exercises) *(2)*. Each type of exercise has its own benefits and challenges to consider during the planning phase. Host countries and event organizers may want to conduct different exercises depending on their purpose, objectives and scope. Further information on the different types of exercises and how to design and develop them are provided in the core guidance from which this document is developed, the *WHO Simulation Exercise Manual (2,9)*.

Methods for performing simulation exercises

Conducting a SimEx requires dedicated planning and resources that should be incorporated into wider MG planning and preparedness for upcoming events. While methods vary, depending on the type of SimEx which event holders want to conduct, all SimEx planning should start by defining its purpose, objectives and scope. SimEx scenarios should be built around the objectives stakeholders want to achieve by doing the exercise. Its scope can be focused on testing a specific MG activity, an EPRP or SOPs for an identified specific hazard; or alternatively SimEx can have a broader scope, encompassing the key activities of MG preparedness and response and the potential hazards identified via the risk assessment process *(2,9)*. During the planning phase of the MG event, SimEx debriefs should be embedded to ensure that gaps and lessons identified are recorded and that recommendations are taken up and addressed prior to the MG event *(1,2)*.

An MG SimEx toolkit has been developed to support country-specific exercise planning. This toolkit includes hazard-specific scenarios and a set of tools and templates designed to help stakeholders test emergency response plans for key mass gathering risks, such as crowd surges, foodborne disease outbreaks, CBRN incidents, and heatwaves. These examples are adaptable to each country's context and should be used alongside broader exercise planning to enhance preparedness.

The MG SimEx toolkit, detailed in Annex 1, includes:

- Facilitator's Guide (Tool 1)
- Concept Note (Tool 2)
- SimEx Scenarios (Tool 3) – Hazard-specific examples
- Participant's Guide (Tool 4)
- Feedback Form Template (Tool 5)

Scope

When planning a SimEx for an upcoming mass gathering, stakeholders should start developing a scoping document and related activities well in advance of the event. This allows sufficient time to define and agree on SimEx purpose and objectives, align stakeholders, design the exercise and address any logistic aspects. The SimEx should be planned after the risk assessment has been completed since findings from the risk assessment can inform and shape the purpose, objectives and scenario of the SimEx. When scheduling a SimEx sufficient resources should be set aside to implement any findings resulting from the SimEx prior to the MG event *(1,2,9)*.

Mass Casualty Management Training, Photo Credit: © WHO / Pierre Berendes

Stakeholders

A variety of relevant multisectoral stakeholders should be considered when planning and conducting a SimEx in the context of a MG event. These persons may include event organizers, Ministry of Health (MoH) officials, regional and local health authorities, ambulance services, local hospitals and health clinics, laboratories, medical staff, nongovernmental organizations (NGOs) and first aid volunteers as well as from other relevant sectors such as media, religious organizations, security forces and tourism agencies. SimEx organizers are responsible for identifying and convening relevant stakeholders and

ensuring that they understand their roles and responsibilities. Health authorities and event organizers should maintain open channels of communications and involve sectors across government if appropriate. Not all stakeholders may have direct expertise in MG preparedness, but they may be engaged in the response to mass casualty incidents or public health emergencies occurring during or after a MG: such groups should therefore be involved in SimEx and preparedness activities for a MG event *(1,2,9)*.

Enabling factors and challenges

Experts in mass gatherings, country, regional and local representatives, and event organizers have identified a number of enabling factors and challenges in planning and conducting SimEx for MGs. Awareness-raising and strong political will may be needed to demonstrate the benefits of conducting SimEx versus simply reviewing lessons learned from previous events. Simulation exercises are crucial to produce customized risk-mitigation measures and emergency-response plans that are specific to the hosting country and region. They provide a practical platform for testing and assessing the effectiveness of risk mitigation measures and emergency response plans for MGs or a specific component of the health system capacity in terms of its preparedness for an MG event. This iterative process facilitates a comprehensive and proactive approach to MG event health and safety.

Debriefing with all relevant stakeholders immediately after the SimEx is a core part of the process: it ensures that recommendations gained from the exercise can support not only preparedness for future MG events but also strengthen local and country health systems and national International Health Regulations (IHR) core capacities.

Challenges in conducting a SimEx during MG preparedness phase may include limitations of time and resources (both financial and human), and a lack of intersectoral coordination and understanding of the value of undertaking SimEx. Incorporating MG considerations into an already scheduled SimEx may reduce financial burdens and enhance multisectoral engagement. Promoting lessons learned and highlighting the benefits of SimEx in MG preparedness processes allows more stakeholders to understand added value and how SimEx helps to identify public health risks ahead of a MG and measures to mitigate these risks. Finally, SimEx can improve public health communication and clarify methods for framing, approving and disseminating public health advice for event participants.

MG considerations and context should be incorporated into a country's national SimEx programme, allowing unforeseen risks and concerns to be addressed in general preparedness initiatives. A tailored response to the event also provides a solution for organizers and ensures a better outcome should any public health issues arise. This approach can more broadly improve preparedness and response activities for unplanned or spontaneous MGs. Many countries must contend with limited resources and – occasionally – political constraints, which may reduce efforts to conduct regular SimEx as part of MG preparedness. A significant challenge is often posed by the MG readiness timeline, since events are commonly not fully organized until weeks or even days before they begin, primarily due to economic constraints. Tabletop exercise scenarios for unique events in a country can therefore be very useful during the preparedness phase.

Chapter 3. After action reviews of mass gatherings

Overview

An after action review (AAR) is a qualitative assessment of activities undertaken in response to a public health event or emergency *(3)*. In the context of mass gathering events, AARs can provide event organizers, health authorities and other stakeholders with a valuable opportunity to systematically review how preparedness and response activities were undertaken for a given MG event. AARs can also help identify best practices, gaps and lessons learned be observed when preparing for and hosting future gatherings. AAR outputs may include corrective actions that should be implemented immediately to ensure improved readiness for future events, as well as medium- and long-term measures needed to strengthen public health and health-care systems, as well as the IHR core capacities of host countries *(1,3)*. AARs are also important components of the global evidence-base on mass gatherings and can help stakeholders across diverse contexts and sectors apply a risk-based, team-oriented approach to planning, preparing for and safely delivering a wide range of events at all levels. Additionally, linking AARs to documentation of MG legacies (short- and long-term improvements to public health and health-care infrastructure, health behaviours and cross-sector coordination among other factors that may persist after an event ends) can further strengthen post-event learning and promote preparedness for future events *(1,5)*.

Methods for performing after action reviews

There are several qualitative methods that are well-suited to AARs, including small group debriefs, working group meetings, key informant interviews, questionnaires, surveys, case study analyses and/or a combination of all the above. These activities may be undertaken by event organizers and stakeholders themselves. Formal AARs carried out by external, objective assessors may also be undertaken, but often take longer to conduct and require advance planning. Regardless of the method chosen, it is critical that AARs should be directly linked to gaps identified during the risk assessment and SimEx activities conducted prior to the event in the planning phase. This approach can help facilitators determine the types of questions and issues to raise during the AAR process. It may also help AAR participants to determine whether planning, preparedness and mitigation activities undertaken during the event adequately anticipated and addressed identified risks and capacity gaps *(3)*.

To determine the appropriate AAR methodology, WHO's AAR guidance is available online *(3)*. Facilitators are also recommended to enrol in the following online course to learn more about the process of conducting AARs: *Management and Facilitation of an After Action Review* (AAR) (OpenWHO) *(10)*. Templates and other relevant tools for developing and delivering AAR for MGs are available in Annex 2.

Scope

Event organizers should strive to embed AAR considerations within the planning and preparedness phase of the event. Relevant considerations could include but are not limited to which stakeholders to engage in the AAR process, which method(s) to use, how to disseminate and institutionalize findings and how to evaluate event legacy considerations. After undertaking this kind of planning, organizers

should ensure that AARs for mass gathering events are performed soon after the event ends since many stakeholders may leave their positions or move to other locations following the event. Given the stresses and demands placed on event organizers and stakeholders during an event, it may be practical to engage AAR participants in a debrief immediately after the event to ensure that urgent and/or high-priority takeaways are captured. Facilitators may then wish to follow up with AAR participants a few days or weeks later with more in-depth review activities, such as surveys, interviews and/or meetings. These follow-up activities are instrumental in capturing more nuanced lessons and takeaways from an event *(1,3)*.

Stakeholders

Reviewing the risk assessment results for an event – as well as AARs from similar events held previously – may provide planners with further insights into which communities, sectors and/or stakeholders to engage in the AAR process *(1,3,5,10)*. Key to the success of any AAR is retaining any participant who was involved in the event for review. AARs conducted for major international sporting events, for example, may require involvement from a broad range of stakeholders from government, industry and other sectors, while religious gatherings require the participation of faith-based organizations leaders and congregants. AARs for other large-scale gatherings (e.g. conferences, concerts, festivals, etc.) will probably require stakeholders from many sectors including law enforcement and security, business, entertainment, and travel and tourism to be met. Conversely, AARs following grassroots and/or unplanned or spontaneous gatherings may not require such a broad, cross-sectoral stakeholder representation.

Contribution to legacy evaluation

Mass gathering events are uniquely positioned to create public health legacies in host communities, whether through infrastructural improvements, greater health-care surge capacities, improved hygiene and health promotion activities, or stronger channels of communication between sectors and among host communities. This can start with the AAR *(1)*. In particular, recurring events (e.g. Hajj, FIFA World Cups, Olympic and Paralympic Games) offer planners and stakeholders a unique opportunity to assess legacy impacts longitudinally, both across diverse settings (in different host countries) and within specific fields (e.g. emergency medicine or public health). During the AAR process, for instance, stakeholders may wish to draft a sustainability strategy to ensure that local communities maintain and continue to benefit from public health and health system improvements long after the event in question ends *(1,11)*. An outstanding example is the 2020 Tokyo Olympic and Paralympic Games, which demonstrated to the world that the largest mass gathering event could be successfully conducted during the COVID-19 pandemic *(12)*.

Enabling factors and challenges

There are several enabling factors that can help ensure AARs are carried out efficiently. Firstly, a robust risk assessment performed early during event planning and preparedness phases can guide decision-making about which gaps or risks merit focused review and which stakeholders should be engaged in an AAR. Secondly, high-level political and financial commitment and advocacy are crucial to ensure that host countries' stakeholders prioritize AARs. Early, regular engagement between event planners, public authorities, policy-makers and other relevant decision-makers helps to generate buy-in and facilitate participation in the AAR process both during and after an event. Encouraging technical exchanges between event organizers across diverse settings may further promote AARs as an important best practice (e.g. the *WHO's Mass Gathering Observer Programme) (3,13)*. Finally, identifying ways to simplify and standardize the AAR process and embed it within existing practices and structures may further encourage host authorities and event organizers to undertake and publish AARs more routinely.

Insufficient buy-in from event decision-makers can limit efforts to embed AARs within event planning and preparedness processes. A lack of effort to link the AAR activities to key findings from the risk assessment and relevant findings from previous AAR or SimEx activities may also hinder event planners from collecting robust evidence to inform future MG events. Similarly, it may also prove difficult to encourage key stakeholders to share lessons learned if they leave immediately following an event. Finally, failure to plan AARs in advance of an event can also negatively impact learning and evaluation activities and undermine efforts to build event legacies.

Best practices and recommendations for conducting mass gathering after action reviews[1]

Integration of AAR considerations in event lifecycle

AAR considerations, crucially embedded in event planning, preparedness and delivery, encompass resource needs, timing/methods, stakeholder involvement, lesson application, fostering learning environments, sharing findings and institutionalizing best practices *(3)*.

- All stakeholder viewpoints must be respected and provided in a psychologically safe environment.
- Facilitators should emphasize cultural sensitivity and avoid individual/team performance assessments.
- Facilitators should be cognizant of not imposing their own personal bias.

Review of successes and challenges in event delivery and implementation of event plans

AARs should assess successes and challenges in both event delivery and plan implementation, which help to identify areas for improvement during event delivery and suggest changes before future events.

[1] These best practices and recommendations for conducting mass gathering after action reviews have been developed through a series of preliminary consultations conducted by WHO and partners with experts in mass gathering preparedness, event organizers and country/regional representatives. Statements made in the recommendations also align with existing best practices and recommendations in respective WHO guidance documents on mass gathering preparedness, guidance on SimEx and guidance on AARs.

Concluding remarks

Mass gathering events can bring a broad range of health, social, economic and political benefits to participants, attendees and host communities. Implementing a risk-based approach to event planning empowers stakeholders to proactively assess and mitigate identified risks and learn from potential health emergencies associated with MGs. Early planning and engagement with relevant sectors can improve public awareness of health risks, strengthen public health systems and infrastructure, and enhance collaborative partnerships *(1,4,5)*. Simulation exercises, in this regard, are critical activities for assessing existing systems, plans and protocols, identifying potential gaps, and addressing the gaps between the existing healthcare system and the specialized medical services established specifically in advance of the MG event *(1,2)*. Following a mass gathering, a proactive post-event documentation of relevant best practices and lessons learned via an after action review can help event organizers to reflect on successes, seek opportunities for improvement and transfer knowledge for future MG events: this, in turn, contributes to the health legacy in host countries and future events Furthermore, it feeds into the global evidence-base on MG planning, preparedness and response *(1,3)*. By incorporating SimEx and AARs into the MG planning process, host country authorities and event organizers can ensure that successful event delivery is safer, and foster event legacies that extend their positive impact within and beyond host communities *(1,5)*.

Walk The Talk, Congo Brazzaville, Photo Credit: © WHO

References

1. World Health Organization. Public health for mass gatherings: key considerations [internet publication].Geneva: WHO; 2015 (https://www.who.int/publications-detail-redirect/public-health-for-mass-gatherings-key-considerations, accessed 8 September 2024).
2. World Health Organization. WHO Simulation Exercise Manual [internet handbook]. Geneva: WHO; 2017 (https://www.who.int/publications/i/item/WHO-WHE-CPI-2017.10, accessed 8 September 2024).
3. World Health Organization. Guidance for after action review (AAR) [internet guideline]. Geneva: WHO; 2024 (https://www.who.int/publications-detail-redirect/WHO-WHE-CPI-2019.4, accessed 8 September 2024).
4. World Health Organization. The generic all-hazards risk assessment and planning tool for mass gathering events [internet platform]. Geneva: WHO; 2024 (https://partnersplatform.who.int/all-hazards-mass-gatherings-risk-assessment, accessed 8 September 2024).
5. The Lancet editorial. Mass gatherings health – creating a public health legacy. Lancet. 2012;380(9836):1. (doi: 10.1016/S0140-6736(12)61108-8).
6. World Health Organization. Managing health risks during mass gatherings [internet document]. Geneva: WHO; 2024 (https://www.who.int/activities/managing-health-risks-during-mass-gatherings, accessed 8 September 2024).
7. Aitsi-Selmi A, Murray V, Heymann D, McCloskey B, Azhar EI, Petersen E et al. Reducing risks to health and wellbeing at mass gatherings: the role of the Sendai Framework for Disaster Risk Reduction. Int J Infect Dis. 2016;47:101-104 (https://doi.org/10.1016/j.ijid.2016.04.006).
8. World Health Organization. WHO mass gathering COVID-19 risk assessment tool: generic events, version 3 [internet tool]. Geneva: WHO; 2022 (https://www.who.int/publications-detail-redirect/10665-333185, accessed 8 September 2024).
9. World Health Organization. Simulation exercises. Geneva: WHO; 2023 (https://www.who.int/emergencies/operations/simulation-exercises, accessed 8 September 2024).
10. World Health Organization. OpenWHO [internet course]. Management and Facilitation of an After Action Review (AAR). Geneva: WHO; 2024 (https://openwho.org/emergencymgmt/496674/After+Action+Review, accessed 8 September 2024).
11. MacAuley D. The health legacy of hosting major sporting events. CMAJ. 2015;187(17):1267 (https://www.cmaj.ca/content/187/17/1267).
12. McCloskey B et al. The Tokyo 2020 and Beijing 2022 Olympic Games held during the COVID-19 pandemic: planning, outcomes, and lessons learnt. Lancet. 2024;403(10425):493–502 (doi:10.1016/S0140-6736(23)02635-1).
13. United Kingdom Government. London 2012 Olympic and Paralympic Games: UK Health/WHO's Mass Gathering Observer Programme. London: UK Health Protection Agency; 2012 (https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/398961/5__London_2012_Health_Observer_Programme_Report.pdf, accessed 8 September 2024).

Further reading and resource materials

Table 1. Relevant mass gathering guidance and tools

Title	Summary
Public health for mass gatherings: key considerations (January 2015)	This document was devised as a resource to support planning and management of MG events. It draws on experiences from past MGs that suggest certain common critical factors and preconditions for success, as well as strategic, organizational, and tactical "lessons learned" that can be applied to future gatherings.
Public health preparedness for mass gathering events: online training (*online course*)	The online course provides an overview of the key steps and considerations that a host country will need to take when planning to host a MGs.
The generic all-hazards risk assessment tool for mass gathering events (November 2023)	The purpose of the all-hazards mass gathering risk assessment tool is to identify hazards related to the event, assess and quantify the overall level of risk, identify and account for precautionary measures that may reduce the risk, making the event safer.

Table 2. Relevant SimEx guidance and tools

Title	Summary
WHO Simulation Exercise Manual (February 2017)	This manual provides an overview of the different type of simulation exercise and related existing tools.
WHO Simulation Exercise Management: Introduction (*online course*)	This is an introductory course on simulation exercises and their value as part of wider emergency preparedness to raise awareness among a non-technical audience.

Table 3. Relevant AAR guidance and tools

Title	Summary
WHO Guidance for after action review (AAR) (April 2019)	WHO Guidance for after action review (AAR) presents the methodology for planning and implementing a successful AAR to review actions taken in response to an event of public health concern.
The global practice of after action review (January 2019)	This literature review was undertaken to identify and build understanding about the principal characteristics of AARs, including their methodologies, formats, planning and roles.
AAR toolkits (September 2019)	WHO published guidance on after action review (AAR) and accompanying toolkits to assist in planning, preparing and conducting AARs following the response to a public health event or emergency.
Management and facilitation of an after action review (AAR) (*online course*)	This course provides a general introduction to the management and the facilitation of an after action review (AAR) following the response to an event of public health concern.

Annex 1. Mass gathering simulation exercise toolkit

This toolkit provides tools developed to support host countries, stakeholders and event organizers in SimEx design and implementation during the mass gathering planning phase. These tools should be adapted to the country and specific needs of the MG event.

Tool number	Tool	Description
1	**Facilitator's guide**	The facilitator's guide is a comprehensive resource that provides instructions and recommendations for facilitators to help design and conduct a SimEx in the context of a mass gathering (MG) event.
2	**Concept note template**	This template outlines the key preparatory elements needed for a simulation exercise in the context of a MG event (i.e. the purpose, objectives, scope and date; key participants; methodologies; proposed budget; exercise management team members and their roles).
3	**SimEx scenarios**	Simulation exercises provide a practical platform to test and evaluate the effectiveness of risk mitigation strategies and event response plans for MGs in a controlled environment. Scenarios are designed to test if plans are fit for purpose, and to gauge the knowledge level of such plans for policy development by a government audience. They should be combined with functional and additional table-top simulation exercises to assess the operational implementation planning among a broader audience. Guidance on developing simulation exercises can be found in WHO SimEx Manual *(1)*. This tool includes four hazard-specific scenarios examples from different areas of MG risk assessment: • scenario 1: foodborne outbreak; • scenario 2: crowd surge; • scenario 3: chemical spill; and • scenario 4: heatwave. It is important to note that the SimEx exercise management team should adapt scenarios, purpose and objectives to their local and MG event-specific context.
4	**Participant's guide**	The SimEx exercise management team should adapt the participant's guide to their own SimEx, taking into account local and event-specific context.
5	**Feedback form template**	The feedback form captures further feedback from participants in addition to the debrief.

References

1. World Health Organization. WHO Simulation Exercise Manual [internet handbook]. Geneva: WHO; 2017 (https://www.who.int/publications/i/item/WHO-WHE-CPI-2017.10, accessed 8 September 2024).
2. World Health Organization. OpenWHO Simulation Exercise Management: Introduction [internet course]. Geneva: WHO; 2024 (https://openwho.org/courses/simex, accessed 8 September 2024).
3. World Health Organization. WHO Mass Gatherings All Hazards Risk Assessment Tool [internet platform]. Geneva: WHO; 2024 (https://partnersplatform.who.int/all-hazards-mass-gatherings-risk-assessment, accessed 8 September 2024).
4. World Health Organization. Public health for mass gatherings: key considerations [internet publication]. Geneva: WHO; 2015 (https://www.who.int/publications-detail-redirect/public-health-for-mass-gatherings-key-considerations, accessed 8 September 2024).

Mass gathering simulation exercise toolkit

Tool 1. Facilitator's guide

1. Introduction

This facilitator's guide (Tool 1) is part of the SimEx toolkit, which was developed to conduct a simulation exercise (SimEx) in the context of a mass gathering event[2]. It is designed to complement the four adaptable scenarios available in the SimEx scenarios (Tool 3), which include foodborne disease outbreak, crowd surge, chemical spill and a heatwave incident, providing a comprehensive framework for conducting simulation exercises in preparation for a mass gathering event.

For additional information on SimEx, additional resources can be accessed in the *WHO Simulation Exercise Manual (1)*. It is recommended that SimEx facilitators enrol in the following online course to learn more about how to plan and conduct a SimEx: *Simulation Exercise Management: Introduction (2)*.

1.1 Purpose

This facilitator's guide equips facilitators with key information and background to successfully facilitate a discussion-based exercise related to mass gathering events.

1.2 Exercise management team: roles and responsibilities

The exercise management team includes: exercise manager, facilitator(s), evaluator(s) and participants. Each SimEx varies in size and complexity: one SimEx may require a large exercise management team to conduct it properly whereas another need just a few facilitators who can take on all the above roles, which are described below as set out in the *WHO Simulation Exercise Manual (1)*.

Exercise manager: a single person who supervises the overall conduct of the exercise, ensuring that it proceeds as planned and that its objectives are reached.

[2] The facilitator's guide, as part of the MG SimEx toolkit, has been developed by the Simulation Exercises and Action Reviews Team of the Health Security Preparedness Department, supported by technical experts from the Mass Gatherings Team of the Country Readiness Strengthening Department, both at WHO headquarters.

Key tasks – before, during and after the exercise – include:

Before	• Adapt the SimEx materials to the event-specific context and needs
During	• Provide the welcome and general administration introduction • Remind the participants that this is a safe learning environment • Deliver the exercise briefing • Start the exercise with the scenario and first session information and tasks • Ensure good timekeeping and manage group discussions in the room • Facilitate the recap discussions • Conduct the debrief
After	• Draft the exercise report together with recommendations and follow-up actions to be undertaken, with a timeline for completion.

Facilitator(s): a person(s) who delivers injects and monitoring progress during an exercise. The facilitator supports the exercise manager. The facilitator is the first point of contact for any questions, clarifications or requests. To ensure the smooth running of the exercise and debrief, the facilitator should assist participants to achieve the stated objectives of the simulation. The facilitator should always remain neutral and not provide direct answers to questions raised or identified by single participants, but should rather encourage discussion by all participants while at the same time maintaining the overall flow of the exercise. In large exercises, there may be one lead facilitator and several supporting facilitators.

Evaluator(s): a person who gathers data from the exercise and analyses whether its objectives and targets were met. Their evaluation will include overall performance, operational effectiveness, quality control, capabilities, strengths and weaknesses, and areas for improvement.

Participants: those involved in the exercise and performing their function and tasks as they would during a real emergency response.

2. Before the exercise

This section focuses on operational planning aspects, which are crucial so that the discussion-based exercise runs smoothly. Developing a tailored concept note (see Tool 2) at this stage plays a pivotal role in moving through the key steps before the exercise. It allows an effective briefing of the exercise manager's team, logistical readiness and customization of the scenarios.

2.1 Customization of the scenarios

The SimEx discussion-based exercise scenarios (Tool 3) should be adapted to local circumstances and event contexts, for instance:

- tailor the SimEx purpose and objectives;
- adapt the scenario details, e.g. by adjusting the numerical values provided;

- reorder the SimEx injects as needed;
- select or modify the inject questions, or introduce additional ones as needed;
- align the exercise objective(s) with the proposed questions and anticipated discussion points (see example below and proposed questions in section 5); and
- adjust timing of the SimEx as needed.

2.2 Briefing of the exercise facilitation team

- If there is more than one facilitator, the lead facilitator should ensure that the exercise team receives comprehensive briefings on:
  - exercise objectives;
  - roles and responsibilities of the exercise team members;
  - participants' profiles;
  - the evaluation process;
  - scenarios and injects; and
  - communication arrangements.
- Ensure that no information is "leaked" outside the exercise. It is important to avoid provoking public alarm with a fictitious scenario. All SimEx documentation must have the words "simulation exercise" written in a visible location.

2.3 Participant selection

- Ensuring the right mix of expertise is critical for a successful simulation exercise, and can be achieved by observing the factors below.
  - **Role alignment**: select participants whose roles align with simulation objectives for a purposeful contribution.
  - **Expertise mix:** ensure a balanced distribution of technical and management expertise among participants to enhance problem-solving.
  - **Experience diversity**: include a mix of junior and senior staff to simulate a realistic organizational response and decision-making dynamics.
  - **Collaborative groups:** organize tables with a blend of technical and management expertise roles to promote collaboration and diverse perspectives.
  - **Interagency collaboration:** include participants from various agencies to mimic real-world collaboration and coordination scenarios.
  - **Clear instructions:** provide participants with clear communication on their roles, responsibilities and overall exercise objectives.

Due consideration of these factors, and careful selection of participants will contribute to the effectiveness of the simulation exercise.

Depending on the size and needs of your participants, consider giving participants a 30-minute briefing, explaining their roles and responsibilities as well as what to expect.

2.4 Logistics and administrative arrangements

- Participants will need information about the exercise sent well before the event. This should consist of an invitation letter with the necessary enlisting instructions, such as SimEx organizers, title, purpose, objectives, logistics details (date, time and location) and target audience, as well as any reference material or plans they may need to bring or read beforehand. A template of an invitation letter can be found in the toolkit of the *WHO Simulation Exercise Manual (1)*.
  - You may consider including some information about the discussion-based exercises methodology if participants are unfamiliar with the concept of simulation exercises.
- To run the exercise successfully there are several logistics activities and resources that need to be completed prior to the activity: refer to the *WHO Simulation Exercise Manual (1)*.
- At the venue you will need to have made the following arrangements.
  - Projector, screen, laptop/computer and option for online connection and simultaneous translation, if needed.
  - Flipchart, paper, and marker pens – to record group-work discussions.
  - Name badges for participants.
  - Consider the room layout: the room should be set up in a way that encourages discussion, preferably in small groups. Consider also how feedback will be given. Ideally the venue should be a conference room, EOC (Emergency Operations Centre), boardroom or other appropriate meeting venue.
  - Consider whether to group participants by agency, role, expertise or seniority at tables or to mix participants so that agencies, roles, expertise and seniority are divided equally among the tables.
  - Consider providing a coffee break as a minimum pause during an exercise.

3. During the exercise

Some tips for successful facilitation during the exercise are listed below.

- Ensure that the exercise starts on time and provide participants with a reasonable amount of time to complete assigned tasks. Regarding significant changes or critical failures in the exercise plan, consult the exercise manager before making decisions.
- Avoid participants anticipating new injects.
- Engage all participants especially those who have not contributed much.

- Reiterate that every participant has a unique viewpoint and expertise and may have access to crucial information related to their field of work.
- Ensure all participants have access to the purpose and objectives of the SimEx.
- Remain neutral.
- Adapt the use of injects based on participants' responses and needs.

4. Tips for running the SimEx scenario PowerPoint presentation

Welcoming the participants

Begin by greeting and thanking everyone. Emphasize the significance of the activity: this is a learning opportunity, offering real-world scenarios to practise problem-solving and teamwork while identifying and addressing risks. Emphasize that participants' feedback is valuable, as it helps to refine processes and empower them to contribute to the organization's success. Keep your welcome brief, to within 3–5 minutes, ensuring a concise introduction to pave the way for a focused and operationally driven exercise. Remember this is a discussion-based exercise not a training or workshop.

Agenda – adapt as needed

Clearly indicate the agenda topic and time, including breaks.

Introductions

During the introduction time, it is important for each participant to briefly provide key information about themselves. This should not exceed 30 seconds each. Here is a suggested format for their introductions:

1. name: begin by stating their name clearly;
2. job title: share their job title and role; and
3. institution: mention the institution/authority or organization they represent.

How to participate

The facilitator needs to communicate the ground rules of a SimEx to all participants, ensuring a structured and respectful environment for the exercise. Here are the proposed rules for exercise participants:

- Use your practices, procedures, guidelines and regulations to inform your responses.
- Do not make up material: the exercise has all the material you require.

- Work as part of a team.
- Focus on solutions.
- Be prepared to provide feedback to the wider group.
- Roles – in this exercise, you will be acting your real-life role.
- Note takers: record discussions and responses to questions.

Scenario assumptions

A clear understanding of scenario assumptions is crucial for both facilitators and participants to make the most out of their experience. Keep the following points in mind.

- The scenario may not exactly replicate or portray your situation. This is fine, and you will have enough information to participate in the exercise. Please don't fight the scenario, it is designed to ensure that the exercise objectives can be achieved.
- There are no tricks or situations to catch you out.
- Please respond to the scenario and injects as you would for an actual health emergency.

SimEx purpose and objectives – example

The purpose and objectives have been developed and adapted during exercise planning to fit the scenario to the local and event-specific context, and need to be achieved through the SimEx activity. The scenarios aim to assess health preparedness and response mechanisms in response to possible health consequences due to different kinds of health emergency incidents in the context of a mass gathering event. Selected objectives focus on testing four core areas of mass gathering preparedness and response: the roles and responsibilities of multisectoral stakeholders, established coordination mechanisms, communication channels within the health sector and between different stakeholders, and the risk communication and community engagement (RCCE) strategy.

5. Start of the simulation exercise (StartEx)

StartEx is the beginning of the simulation exercise. Ensure that all following PowerPoint slides from this moment on are visibly labelled "simulation exercise".

Session 1, 2 and 3: tasks

While each scenario introduces unique challenges through injects, each session includes tasks to enable reflection and discussion regarding selected technical aspects of mass gathering preparedness and response.

Sessions can focus on different groups of technical areas such as:

- emergency preparedness and response, coordination, stakeholders' involvement, roles and responsibilities, training and continuous improvement, resource management and financial contingency, standard operating procedures (SOPs);
- information management and communication within and between health and non-health sectors involved in MG preparedness and response; and
- risk communication and community engagement (RCCE): public information dissemination, misinformation and disinformation strategies.

Participants will navigate through these themes, addressing challenges presented by the discussion injects and gaining insight into effective strategies for disseminating information, managing communication and engaging with the community during health emergencies.

During the SimEx, facilitators should ensure that the proposed questions and anticipated discussion topics are well aligned with the exercise objectives.

Examples of proposed questions that were developed for the four scenarios on different kinds of health emergency incidents can be found below. Adjust the amount, and order and adapt questions as needed to suit your scenario.

Note that the questions in the left column below should also be updated in the PowerPoint slides.

Sessions 1, 2 and 3: recap discussion

On concluding each session, facilitate a comprehensive recap discussion between participants to emphasize key takeaways based on the discussed technical areas of mass gathering preparedness and response and the achievement of exercise objectives.

6. End of the simulation exercise (EndEx)

EndEx means closure of the simulation exercise. Ensure that there is a plan for transitioning from exercise to debrief. Participants may often imagine that the exercise is complete after EndEx and leave the site.

7. Post-exercise debrief

- The lead facilitator is responsible for leading the exercise debrief.
- The debrief is an essential part of the exercise and should be allocated sufficient time.

- The aim of the exercise debrief is to assess the current response arrangements as discussed during the exercise. The debrief will help to identify where these arrangements are working well and where they are unclear or not working so well, and need to be reviewed.
- During the debrief session identify key strengths, gaps and recommendations.
- Ask the participants to consider the following based on the exercise objectives:
  - What went well?
  - What didn't go so well?
  - Which areas ought to be improved?
- Facilitating the debrief session is important to its success. Manage the amount of time that people speak, allow for everybody to have a say, and avoid people "recreating" every step of the exercise: you are looking for a summary. It might help to ask participants for their top one or two points only.
- Capture the strengths, challenges, recommendations, timeframe and responsible focal point identified by participants from the debrief, which will feed back into the final SimEx report via the following table templates:

#	Strengths	Recommendations	Timeframe	Responsible focal point
1				
2				
3				

#	Challenges	Recommendations	Timeframe	Responsible focal point
1				
2				
3				

8. Collection of participants' feedback

Ensure each participant has filled in the feedback forms. A template can be found in Tool 5.

9. Closing remarks

Make sure during your closing remarks to reiterate that these simulation exercises were designed to enhance public health preparedness and response mechanisms during mass gathering events. Participants should now have a clearer understanding of roles, responsibilities, effective coordination, information management, and risk communication and community engagement strategies.

10. Way forward for the exercise management team

- Conduct a comprehensive debrief with the exercise management team, both as a group and individually.
- Share initial exercise debrief results as required with key stakeholders to keep them informed.
- Support or lead the writing of the post-exercise report, ideally within a month, to capture valuable insights and enhance response capabilities.
- Highlight the next steps to implement lessons learned from the exercise within the report, ensuring specific individuals are assigned actions with clear deadlines.
- Ensure on completion of the exercise that senior management actively follows up the assigned action points to drive accountability and continuous improvement.

Mass gathering simulation exercise toolkit

Tool 2. Concept note template

Concept note purpose

This concept note template is developed to support development and conduct of the discussion-based simulation exercise (SimEx) in the context of MG events. The concept note aims to provide a comprehensive understanding of the challenges and opportunities associated with hosting mass gathering events and the benefits of conducting SimEx in their planning and delivery phases.

The recommended structure and key elements of a concept note are outlined below. Please adapt and modify the content according to the local event context.

Title: Health emergency incident (e.g. crowd surge) in the context of a mass gathering event.

Date of simulation exercise: [DD/MM/YYYY], Location: e.g. [city, venue]

1. Background

Mass gathering events can pose significant public health risks and strain the public health resources of the hosting community, city, or country. Hosting MG events requires extensive preparedness and the development of response capabilities. Simulation exercises (SimEx), in this regard, emerge as critical activities for assessing existing systems, plans and protocols, and for identifying potential gaps before a MG event takes place[3].

By integrating SimEx into the MG planning and preparedness process based on risk assessment results, host country authorities and event organizers can ensure safer event delivery and extend their positive impact not only within host communities but also far beyond.

[3] The concept note was developed by the Simulation Exercises and Action Reviews Team of the Health Security Preparedness Department, supported by technical experts from the Mass Gatherings Team of Country Readiness Strengthening Department, both at WHO headquarters.

2. SimEx purpose, scope and objectives

2.1 Purpose

To assess health preparedness and response mechanisms in response to a health emergency incident (e.g. crowd surge) in the context of a mass gathering event.

2.2 Scope

In the form of a discussion-based exercise, participants will be led through a simulated health emergency incident that may occur in the context of a MG event. Participants will review the relevant health emergency preparedness and response plans (EPRPs) and procedures, their roles and responsibilities, coordination and communication mechanisms within and between event organizers, health authorities and other multisectoral partners involved in MG event planning and delivery (law enforcement and security, emergency services, civil protection, environment, tourism sector, etc.).

2.3 Objectives

The objectives of this exercise are:

- *to clarify the roles and responsibilities of health authorities and other stakeholders in responding to a health emergency incident (e.g. crowd surge) according to existing health emergency preparedness and response plans;*
- *to review coordination mechanisms among health authorities and other key stakeholders involved in response to health emergency incident (e.g. crowd surge);*
- *to identify the information management flow within health authorities and with other key stakeholders involved in the response to a health emergency incident (e.g. crowd surge); and*
- *to explore risk communication and community engagement procedures following a health emergency incident (e.g. crowd surge) in the context of MG events.*

3. Date, location and venue and draft agenda

This section must be completed prior to the exercise. It mentions the date, location, venue and focal point. If possible, organize the simulation exercise in existing structures/facilities that are functional during a real-life MG event (e.g. Emergency Operations Centre (EOC))

The anticipated duration of the exercise is approximately 4–5 hours. The debrief is planned to follow immediately after the simulation exercise. A tentative agenda is listed below:

Date: [DD/MM/YYYY] Time: [09:00 – 13:15] Venue: [EOC room, MoH]

Time	Session	Responsible
09:00	*Welcome and introductions*	*Senior leadership*
09:10	*Exercise briefing*	*Lead facilitator*
09:20	StartEx – *Session 1 and recap discussion*	*Lead facilitator*
10:20	*Coffee break*	
10:40	*Session 2 and recap discussion*	*Lead facilitator*
11:40	*Session 3 and recap discussion*	*Lead facilitator*
12:40	EndEx – *Exercise debrief*	*Lead evaluator*
13:15	*Closing*	*Senior leadership*

Exercise management team

The main roles in the exercise management team *(1)*:

Exercise manager: a single person who supervises the overall conduct of the exercise, ensuring that it proceeds as planned and that its objectives are reached.

Facilitator(s): additional persons supporting the exercise manager to deliver injects and monitor progress during an exercise. The facilitator is the first point of contact for any questions, clarifications or requests from participants.

Evaluator(s): a person who gathers data from the exercise and analyses whether its objectives and targets were met. The evaluation includes overall performance, operational effectiveness, quality control, capabilities, strengths and weaknesses, and areas for improvement.

First name/Name	Function	Organization	Contact details
	Exercise manager		
	Facilitator(s)		
	Evaluator(s)		
	Notetaker(s)		
	Report writer		
	Logistics and finance		

4. Exercise participants

Participants can be defined as persons involved in the exercise who are performing their function and tasks as they would do during a real emergency response. Their profile will depend on the context of the MG event and its location and scale. The exercise should involve key decision-makers who would normally be involved in the planning and delivery of MG events.

For example:

1. **Health authorities:** responsible for setting up plans and responding to health-related issues at MG events, including but not limited to food and water safety, disease prevention and control, surveillance, emergency medical services, waste disposal, etc.
2. **Event organizers:** authorities involved in planning and delivering the event.
3. **Government authorities:** may include city or municipal government employees, as well as county, state, or provincial authorities (at local, regional and national levels).
4. **Emergency management agencies:** agencies coordinating responses to emergencies that may occur during a MG event.
5. **Medical service providers:** depending on the scale of the event, may include onsite medical personnel, local hospitals and ambulance services.
6. **Law enforcement, police, safety and security agencies**: responsible for maintaining law and order during the event and supporting the emergency response.
7. **Communications and media entities:** can assist in disseminating information about the event, safety and health advice and emergency operations, and establishing policies on counteracting misinformation and disinformation.
8. **Community groups and nongovernmental organizations (NGOs):** groups which provide various services and support, such as volunteer assistants.

This is a specimen template for a list of exercise participants:

Organization	First name/name	Functional role/ responsibilities	Contact details

5. SimEx report

SimEx notes should be taken during the exercise so that the draft report can be developed as soon as possible and shared with all participants for their review. The SimEx report should then be finalized and sent for approval to the exercise management team.

6. Logistics and budget

This is a specimen template for listing the logistics and tentative costs incurred by arranging the SimEx activity:

Item	Remarks	Tentative cost
Hotel reservations or other accommodation/travel		
Venue and catering		
Writing supplies for participants and evaluators		
Equipment (projector, flipcharts, microphones, etc.)		
Printing material and other miscellaneous costs		
Total Cost		

References

1. World Health Organization. WHO Simulation Exercise Manual [internet handbook]. Geneva: WHO; 2017 (https://www.who.int/publications/i/item/WHO-WHE-CPI-2017.10, accessed 12 September 2024).
2. World Health Organization. WHO Mass Gatherings All Hazards Risk Assessment Tool [platform]. Geneva: WHO; 2024 (https://partnersplatform.who.int/all-hazards-mass-gatherings-risk-assessment, accessed 12 September 2024).
3. World Health Organization. Public health for mass gatherings: key considerations [internet publication]. Geneva: WHO; 2015 (https://www.who.int/publications-detail-redirect/public-health-for-mass-gatherings-key-considerations, accessed 12 September 2024).

Mass gathering Simulation Exercise toolkit

Tool 3. SimEx scenarios examples on health emergency incidents

The purpose of the SimEx scenarios in this practical toolkit is to assess health preparedness and response mechanisms in response to the possible health consequences due to different kinds of health emergency incidents in the context of a mass gathering (MG) event.

The selected objectives focus on testing four core areas of MG preparedness and response: roles and responsibilities of involved multisectoral stakeholders, established coordination mechanisms, communication channels within the health sector and between different stakeholders, and risk communication and community engagement (RCCE) procedures.

Tool 3 SimEx scenarios can be delivered by the simulation exercise management team[4]. The scenarios ought to be adapted to the local and event context by the exercise organizers before the SimEx activity is undertaken.

Please find the link below to the four sets of scenario slides detailing examples of health emergency incidents in the context of a MG event:

- foodborne disease outbreak;
- crowd surge;
- chemical spill; and
- heatwave

https://www.who.int/publications/i/item/mass-gathering-practical-guide-for-simulation-exercises-and-after-action-reviews.

[4] SimEx scenario slides on health emergency incidents were developed by the Simulation Exercises and Action Reviews Team of the Health Security Preparedness Department, supported by technical experts from the Mass Gatherings Team of the Country Readiness Strengthening Department, both at WHO headquarters.

Mass Gathering Simulation Exercise Toolkit

Tool 4. Participant's guide

1. Introduction

Tool 4 has been developed to guide participants through the discussion-based simulation exercise (SimEx)[5]. This guide will provide them with important information and instructions to help them navigate the exercise successfully. It has used crowd surge as an example scenario: update accordingly based on your own event.

2. SimEx purpose, scope and objectives

2.1 Purpose

To assess health preparedness and response mechanisms in response to health emergency incident (e.g. crowd surge) in the context of a MG event.

2.2 Scope

In the form of a discussion-based exercise, participants will be led through a simulated health emergency incident that may occur in the context of a MG event. Participants should review the relevant health emergency preparedness and response plans and procedures, their roles and responsibilities, coordination and communication mechanisms within and between event organizers, health authorities and other multisectoral partners involved in MG event planning and delivery (law and security enforcement, emergency services, civil protection, environment, tourism sector, etc.).

2.3 Objectives

The objectives of this exercise are:

- to clarify the roles and responsibilities of health authorities and other stakeholders in responding to a health emergency incident (e.g. crowd surge) according to existing health emergency preparedness and response plans (EPRPs);

[5] The Participant's guide has been developed by Simulation Exercises and Action Reviews Team of the WHO HQ Health Security Preparedness Department, supported by the technical experts from the WHO HQ Mass Gatherings Team of Country Readiness Strengthening Department.

- to review coordination mechanisms among health authorities and other key stakeholders involved in the response to a health emergency incident (e.g. crowd surge);
- to identify the information management flow between health authorities and with other key stakeholders involved in the response to a health emergency incident (e.g. crowd surge); and
- to explore RCCE procedures in response to a health emergency incident (e.g. crowd surge) in the context of a MG event.

3. Agenda

Time	Session	Responsible
09:00	*Welcome and introductions*	*Senior leadership*
09:10	*Exercise briefing*	*Exercise manager*
09:20	StartEx – *Session 1 and recap discussion*	*Lead facilitator*
10:20	*Coffee break*	
10:40	*Session 2 and recap discussion*	*Lead facilitator*
11:40	*Session 3 and recap discussion*	*Lead facilitator*
12:40	EndEx - *Exercise debrief*	*Lead evaluator*
13:15	*Closing followed by lunch*	*Senior leadership*

4. Rules on how to participate in a SimEx and scenario assumptions

4.1 SimEx rules

- Use your usual practices, procedures, guidelines and regulations to inform your responses.
- Do not make up material: the exercise has all the material you require.
- Work as part of a team.
- Focus on solutions.
- Record discussions and responses to questions.
- Be prepared to recap to the wider group.
- Roles – you will be playing yourself in this exercise. Do not make up roles.

4.2 Scenario assumptions

- Material used for the simulation exercise may differ from reality. All documentation is for simulation purposes only.
- Do not criticize the scenario: embrace it since it is designed to ensure that the exercise objectives can be achieved.
- Please respond to the scenario and inject discussions as you would for an actual incident.

Mass gathering Simulation Exercise toolkit

Tool 5. Feedback form template

This feedback form template is designed for a discussion-based simulation exercise: it is intended to allow participants to provide feedback on its strengths and areas for improvement for the exercise management team[6]. This feedback will help to improve future SimEx in the context of mass gathering events.

Title: PARTICIPANT'S FEEDBACK FORM FOR A SIMULATION EXERCISE IN THE CONTEXT OF A MG EVENT

< SimEx: Title, Venue, Date >

Please provide your feedback on this exercise based on the following questions:

(On a scale of 1 to 5, where 1 means you strongly disagree with the statement and 5 means you strongly agree with the statement.)

Statement	Strongly disagree		→		Strongly agree
1. The simulation exercise was well structured (content, facilitation, debrief, etc.)	1	2	3	4	5
2. The scenario was realistic	1	2	3	4	5
3. I was familiar with the preparedness and response plan based on the local and event context prior to participating in this exercise	1	2	3	4	5
4. The simulation exercise briefing was useful for engaging participants	1	2	3	4	5
5. The simulation exercise was able to test specific areas of the mass gathering preparedness and response plans and/or health systems	1	2	3	4	5
6. The simulation exercise helped to clarify my and other key stakeholder roles and responsibilities identified through the mass gathering preparedness and response plans	1	2	3	4	5

[6] The feedback form template was developed by the Simulation Exercises and Action Reviews Team of the Health Security Preparedness Department, supported by technical experts from the Mass Gatherings Team of the Country Readiness Strengthening Department, both at WHO headquarters.

Statement	Strongly disagree	→			Strongly agree
7. The simulation exercise identified opportunities to strengthen multisectoral coordination and communication mechanisms in the context of mass gatherings	1	2	3	4	5
8. The simulation exercise identified opportunities to strengthen risk communications and community engagement capacities and functions in the context of mass gatherings	1	2	3	4	5
9. The simulation exercise was helpful to identify gaps and areas for improvement in relation to health emergency incident preparedness and response in the context of mass gatherings	1	2	3	4	5
10. Administrative arrangements were well organized and implemented	1	2	3	4	5
11. The simulation exercise provided a practical platform to test and assess the effectiveness of risk mitigation strategies and emergency response plans for mass gatherings	1	2	3	4	5

Please share your additional suggestions and recommendations:

Thank you!

Annex 2. Mass gathering after action review toolkit

This toolkit provides a database of trigger questions (Excel) developed to support host countries, stakeholders and event organizers in the facilitation of AARs *(1)* following a MG event.

Tool 1. Mass gathering AAR trigger question database

The trigger questions are organized by technical area to guide and enhance discussions, whether in a group setting or with individuals during an AAR.

The selected trigger questions should be adapted to reflect the host country's context and the specific requirements of the MG event.

To access the Mass Gathering AAR trigger question database, follow this link: https://www.who.int/publications/i/item/mass-gathering-practical-guide-for-simulation-exercises-and-after-action-reviews

Please note that additional tools for planning and conduct an AAR are available on the WHO website *(2)*

REFERENCES

1. World Health Organization. Guidance for after action review (AAR) [internet guideline]. Geneva: WHO; 2024 (https://www.who.int/publications-detail-redirect/WHO-WHE-CPI-2019.4, accessed 12 September 2024).
2. WHO Emergency response reviews webpage https://www.who.int/emergencies/operations/emergency-response-reviews

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