

Introduction

- Mass gatherings can be defined as any public gathering that attracts sufficient people to strain the planning and resources of the community, city or nation hosting the event.¹
- Mass Gatherings Health (MGH) includes emergency medical care at mass gatherings, as well as broader contributors to health including security and policing, water quality, food safety, health promotion, injury/illness prevention and harm reduction.
- Patterns of illness and injury at mass gatherings differ from those of the host community necessitating mass gathering specific research to optimize healthcare delivery.



Images 1 and 2. Left^{2,3}. Annually the Hajj attracts several million pilgrims to Mecca, causing significant challenges for health services. Right. Music festivals, often held in rural settings, have the potential to overwhelm baseline community health resources and create unique challenges when providing emergency medical care.

- Currently, MGH literature focuses on case reports and series chronicling emergency care at mass gatherings; however, MGH researchers have more recently called for more quantifiable, generalizable, and theory driven MGH research.
- Before higher order research questions can be answered, the widespread ground-level issue of poor data quality at mass gatherings must be addressed.**
- We draw on our collective experience providing care at mass gatherings, as well as the creation and maintenance of a web-based Event and Patient Registry containing more than 20,000 patient encounters to address the operational issue of poor data quality at mass gatherings.²



Image 3. MGH services at some mass gatherings are extensive, and multidisciplinary health care teams provide quality emergency medical care. Kerrie Lewis, Copyright 2011 – Subaru Ironman

Data Quality Challenges

- Common MGH data quality problems include illegibility of charting, missing data fields, missing time stamps, and undocumented patient encounters.⁴
- Factors leading to poor data quality are complex and result from a combination of human, environmental, and logistical factors.



Image 4. Busy medical tents can have incomplete documentation as the patient may have multiple providers with multiple handovers of care. There may be confusion as to who is in charge of the final copy of the chart. Kerrie Lewis, Copyright 2013 – Subaru Ironman

Image 5. The relaxed and often casual atmosphere of mass gatherings is an attraction for many providers; however, it can negatively influence documentation as providers may be distracted from paperwork in face of supporting athletes, listening to musicians, or enjoying the festival. Kerrie Lewis, Copyright 2011 – GranFondo Whistler



Table 1. Human, environmental, and logistical factors influencing data quality in mass gatherings health research

Human	Environmental	Logistical
Variable documentation styles (narrative vs. checkbox)	Climate/Weather	Poor patient care record design
Casual atmosphere at mass gatherings may distract providers	Event type/Location	Inadequate staff training on documentation
Unclear expectations regarding comprehensiveness of documentation	Patient Presentation Rate (PPR)	Unclear responsibility for who should document a patient encounter
Illegible handwriting	Demographics	Multiple forms generated for a single patient at an event (field, main medical, transfer form)



Image 6. Documentation can be challenging during mass gatherings. Limited resources, dynamic environments, and complex patients can result in incomplete paperwork after some encounters. Shana Jamani Lund, Copyright 2012 - BMX Supercross Event

Recommendations

- The factors influencing data quality at mass gatherings are complex, and a combination of solutions may need to be employed.
- Pre-event planning, on-site actions, and post-event follow up can all be used to improve data quality.

Table 2. Recommendations for improving data quality at mass gatherings

Pre-event Planning	On-site Actions	Post-event Follow-up
Create a culture of excellence surrounding documentation (from top down).	Ensure staff are informed of expectations regarding comprehensiveness of documentation (show a poorly completed form).	Inform staff of post-event audits of paperwork. ⁵
Ensure adequate staffing to prevent staff from becoming overwhelmed with patient care duties.	Remind staff of the importance of their documentation for ongoing MGH research. ⁵	Debrief staff on documentation during normal post-event debriefs.
Design forms to be concise, intuitive, and capable of meeting the research needs.	Clarify team roles and ensure an individual is responsible for documenting each patient encounter.	Record recommendations from staff to improve documentation.
Use Electronic Medical Records (if feasible).	Assign a staff member in charge of data quality for the event.	Make a concrete plan to implement recommendations for the next event in the early post-event phase.

Conclusion

- This is an exciting time for MGH as higher order research questions are beginning to be addressed; however, to perform quality research we must build from the ground up and address the core issue of poor data quality.

References

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