What Data are Gathered in Mass-Casualty Incidents? A Scoping Review

Michael Pallot, MBChB, MA;[1] Sarah Alvi, MBChB;[2] Jade Hanley, MBChB;[3] Anisa Jafar, MBChB, FRCEM, PhD, MPH, MRCP, DTM&H[2,4]

1. Department of Anesthesia, Hywel Dda Health Board, Glangwili Hospital, Carmarthen, United Kingdom
2. Humanitarian and Conflict Response Institute (HCRI), University of Manchester, Manchester, United Kingdom
3. Department of Anesthetics, University Hospitals Birmingham, United Kingdom
4. Royal Manchester Children's Hospital, Manchester Foundation Trust, Manchester, United Kingdom

Correspondence:
Anisa Jafar, MBChB, FRCEM, PhD, MPH, MRCP, DTM&H
Humanitarian and Conflict Response Institute (HCRI)
University of Manchester
Ellen Wilkinson Building
Manchester M15 6JA, United Kingdom
E-mail: anisa.jafar@manchester.ac.uk

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Abbreviations:
MCI: mass-casualty incident
PRISMA-ScR: Preferred Reporting Items for Systematic Reviews and Meta-Analyses, extension for Scoping Reviews
WHO: World Health Organization

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Abstract

Background: Mass-casualty incidents (MCIs) are overwhelming events which generate a surge in casualties, exceeding local capacity and stressing emergency services. Significant mortality, morbidity, and economic impact is often caused. They attract responses from both local and international governmental and non-governmental medical responders. To improve professional standards and accountability, there has been much recent focus on record-keeping by teams in these contexts. This paper seeks to further understand what data are gathered and shared as a result of MCIs to outline current practice and help move towards improved minimum standards of documentation.

Methods: A structured database search and abstract screening process was conducted utilizing PRISMA guidelines for scoping reviews. Data were then collected from all papers identified. To ensure all relevant data were gathered, authors of each included study were contacted to clarify their approach to data collection for their work.

Results: From 154 included manuscripts, 64 data categories were found and recorded, capturing MCIs over a period of 32 years located in 42 countries from all World Health Organization (WHO) global regions. Retrospective and contemporaneous data collection was equally prevalent. In-hospital or research team data collection was most common. The ten most common data categories collected were: number of injuries (94.8%), number of deaths (89.6%), injury type (81.2%), cause of injury (79.9%), age (63.0%), sex (63.0%), treatment (62.3%), severity of injury (61.7%), outcome of injury (59.1%), and investigations/treatments given (55.8%). Of the contactable authors, only 29 responded. Sixteen reported reviewing notes retrospectively or using follow-up patient interviews.

Discussion & Conclusions: There was significant variety in what data were collected, who collected it, and how it was done. The most common data categories were descriptive pieces of information or related to demographics. Only one-half of papers discussed treatments given. Information on both prehospital care and longer-term rehabilitation was much less prevalent.

Terrorism and shooting related MCIs were the largest by paper number. Predominantly made up of more recent MCIs in higher income countries, these findings potentially reflect more organized health care systems.

Overall, data collection in MCIs is challenging and heavily reliant on retrospective analysis. Current practice lacks standardization. If professionalism and accountability for health care delivery in MCIs is to be improved, so must the methods of data collection and minimum standards of documentation.

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Introduction

A mass-casualty incident (MCI) is an overwhelming and unexpected event that generates a surge in casualties, exceeding local capacity to handle the sudden demand by standard means. It often requires implementation of emergency contingency plans or extraordinary

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Name of Database	Search	Number of Results
Embase	Injury recording.mp. (data acquisition or data collection or data recording or data reporting or datasets as topic or recording, data or records or records as topic).af. (mass casualty incidents or mass casualty accidents or mass casualty disasters or mascal).af. 1 or 2 3 and 4	47
MEDLINE(R)	Mass Casualty Incidents/cl, mo, sn [Classification, Mortality, Statistics & Numerical Data Limit to humans	310
APA PSYCInfo	mass casualty incident.mp. mass casualty accident.mp. exp Disasters/ or mass casualty disaster.mp. 1 or 3 Data collection.mp. or exp Data Collection/ exp Medical Records/ or health records.mp. 5 or 6 3 and 7	267
HMIC	mass casualty incident.mp. or exp Terrorism/ or exp Disaster services/ exp Terrorism/ or mass casualty event.mp. or exp Major incidents/ data collection.mp. or exp Data Collection/ 1 or 2 3 and 4	10
PubMed	(((mass casualty incident) OR (mass casualty event) OR (mass casualty accident)) AND ((data collection) OR (injury reporting)))	760

Figure 1. Search Terms and Databases.

assistance.[1–3] The nature of the MCI and context in which it occurs can vary significantly, necessitating different degrees of local or international response. However, MCIs have the potential to place a sizeable strain on existing health and emergency response services and can result in significant mortality, morbidity, and economic impact.[1]

Typically, MCIs attract responses from both local and international governmental as well as non-governmental medical responders. It is well-documented that record keeping by medical teams in disasters is often poor.[4] A focus on better medical record keeping by medical teams in these contexts is part of an overall move to improve professionalism, accountability, and standards in the provision of humanitarian aid, and applies equally to MCIs subject to a stable domestic response.[4–6] Medical record keeping is not only a key pillar of good medical practice, but it also allows for retrospective analysis of care provided. This in turn enables learning and improvements to be made for the benefit of future patients.

Mass-casualty incidents can be subcategorized based on the nature of the incident, such as natural disasters, shootings, terrorism, vehicular incidents, war and conflict, and mass gatherings.[1,7–9] Their incidence is rising globally, a trend that is predicted to continue.[10,11] The climate emergency in particular is expected to increase the frequency of MCIs due to both "natural" events (indirectly, also man-made) such as famine and wildfires,[12] and more directly "man-made" events such as terrorism and war due to increased political instability.[13]

With this in mind, this review seeks to understand which data are currently recorded during MCIs, including how this was done and by whom. A scoping review has been undertaken with the aim of understanding current practice as published in the academic literature. The review includes the spectrum of data collected and published pertaining to MCIs, whether retrospective or contemporaneous, to create an understanding of which data categories are being valued enough to collect and also report upon. This will allow the international community to reflect on whether the most important data are being prioritized appropriately and this, in turn, may contribute to a wider move towards standardization and improved minimum standards of documentation in complex and challenging MCIs.

Methods

This scoping review was carried out in conjunction with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses,[14] extension for Scoping Reviews (PRISMA-ScR) statements and updated guidelines. To limit uncertainty and minimize gaps in the data, authors of each paper included were then contacted to further clarify their approach to data collection for their work.

Eligibility, Information Sources, and Search Strategy

Several databases were consulted. On the OVID platform, the databases Embase (Elsevier; Amsterdam, Netherlands); Health Management and Policy Database (HMIC; UK Department of Health & King's Fund Library; London, UK); MEDLINE (US National Library of Medicine, National Institutes of Health; Bethesda, Maryland USA); and APA PSYCInfo (American Psychological Association; Washington DC, USA) were used, in addition to PubMed (National Center for Biotechnology

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Inclusion	Exclusion
References to a mass-casualty incident/accident or disaster	No relation to MCI / Accident / Disaster
Information about diagnoses	Organizational preparedness
Reports injuries or injury statistics or morbidity/mortality	Focus on post-MCI mental health provision
Reference to health records/medical records	Published before 1990, not in English, not discussing human data
Papers referring to war or conflicts/battles which occurred in the context of war	No mention of data collection
Simulated mass-casualty incidents/disasters	Review articles

Figure 2. Inclusion and Exclusion Criteria.
Abbreviation: MCI, mass-casualty incident.

Information, National Institutes of Health; Bethesda, Maryland USA). Search terms were modified in each database to yield the most relevant results without missing crucial papers. These search pathways are listed in Figure 1 alongside the number of papers found by each search.

Each of the search strings were filtered within their databases to produce papers published from the year 1990 through July 25, 2022 (the day the search was performed). Texts were filtered to include only those relevant to humans and those in the English language (due to the language limitations of the authors in being able to screen abstracts).

Following paper selection, each paper was then read in its entirety. Any information within the text, tables, or figures which indicated a specific data point had been collected with respect to the MCI discussed was recorded as a data category such as "age" or "injury type." Initially, this created a new category of data point within an iterative data table; however, as each subsequent paper was read, the same data point categories were frequently noted and therefore marked as present in each paper they were found. At the end of this process, the study team reviewed the data categories and merged any which represented the same information.

Data Selection Process

A total of 1,394 papers were exported into the reference management program, Mendeley Desktop (Version 1.18.9; Elsevier; Amsterdam, Netherlands), to enable easy screening of titles and abstracts and to facilitate removal of duplicate results. Once 185 duplicates were removed, 1,209 papers remained.

Titles were screened in Mendeley, based on their apparent relevance to the question being asked, and 893 titles were excluded, leaving 316. Initially, titles were not excluded based on type of study or specific to any specialty or type of MCI. The remaining 316 were then re-screened based on their abstracts to gain more information about their relevance. The inclusion and exclusion criteria, as displayed in Figure 2, were then applied.

Subsequently, 143 abstracts were removed leaving 173 papers which were reviewed in their entirety by the authors. Two further papers were removed due to not being relevant when the full text was screened, and despite the English language filter, four papers had full text versions not available in English which were removed due to limitations on translation. This left 167 papers. These were then subcategorized based on subject: natural disasters (14), shootings (8), mass gathering/spectator events (11), terrorism (42), vehicular incidents (29), papers covering multiple types of MCI (3), miscellaneous case reports (28), war and conflict (19), and simulation (13). The process is summarized in Figure 3, which is a pictorial representation of the selection process for papers analyzed in this scoping review. The inclusion of simulation papers was deliberate and is discussed under its own heading, however, these papers have been separated from the main data to create a clear distinction, leaving 154 papers.

Data Synthesis

The full-text version of every paper was reviewed in full by the authors. Across all manuscripts, 64 separate data points were collected. This ranged from basic descriptive data such as journal, year, location of MCI, and casualties to whether specific casualty data had or had not been recorded such as age, sex, or treatment. Microsoft Excel (Version 16.54; Microsoft Corp.; Redmond, Washington USA) was utilized to record all data and to provide basic descriptive quantitative data from that entered by the authors. No further statistical analysis was undertaken. A full list of each data point can be seen in Table 1.

Contact with Authors

Authors of each study were approached to further clarify their approach to data collection and attempt to minimize any gaps in the data. In most cases, the papers had a named author for correspondence and provided the relevant email address. Where this was not the case, an internet search was performed to find the email address of the corresponding/lead author. In a number of cases, it was not possible to obtain contact details or the email address provided was no longer in use. Authors were contacted by email with a request for further information on their approach to data collection and asked to provide a blank copy of any data collection forms used. The responses are documented in Results.

Results

Reporting Bias Assessment and Certainty Assessment

Due to the English language filter, the screening process may have resulted in a degree of bias towards English speaking publications and areas of the world. This is discussed further alongside wider limitations of this study. Data collection and synthesis was objective and therefore at minimal risk of bias.

Authors reviewed papers independently to gather data which were manually added to a shared database. There was significant variability in how data were presented in published literature. At times, the authors collected results from narratives within the text of an article as well as from tabulated data. Human error was

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	Contemporaneous	Retrospective	Contemporaneous + Retrospective	Unknown
African Regions	50.0%	33.0%	17.0%	0.0%
Region of the Americas	43.0%	54.0%	3.0%	0.0%
South East Asian Region	56.0%	44.0%	0.0%	0.0%
European Region	47.0%	44.0%	9.0%	0.0%
Eastern Mediterranean Region	27.0%	73.0%	0.0%	0.0%
Western Pacific Region	66.0%	31.0%	3.0%	0.0%
Totals	46.1%	48.7%	4.5%	0.6%

Table 1. When Data Were Collected, by WHO Region
Abbreviation: WHO, World Health Organization.

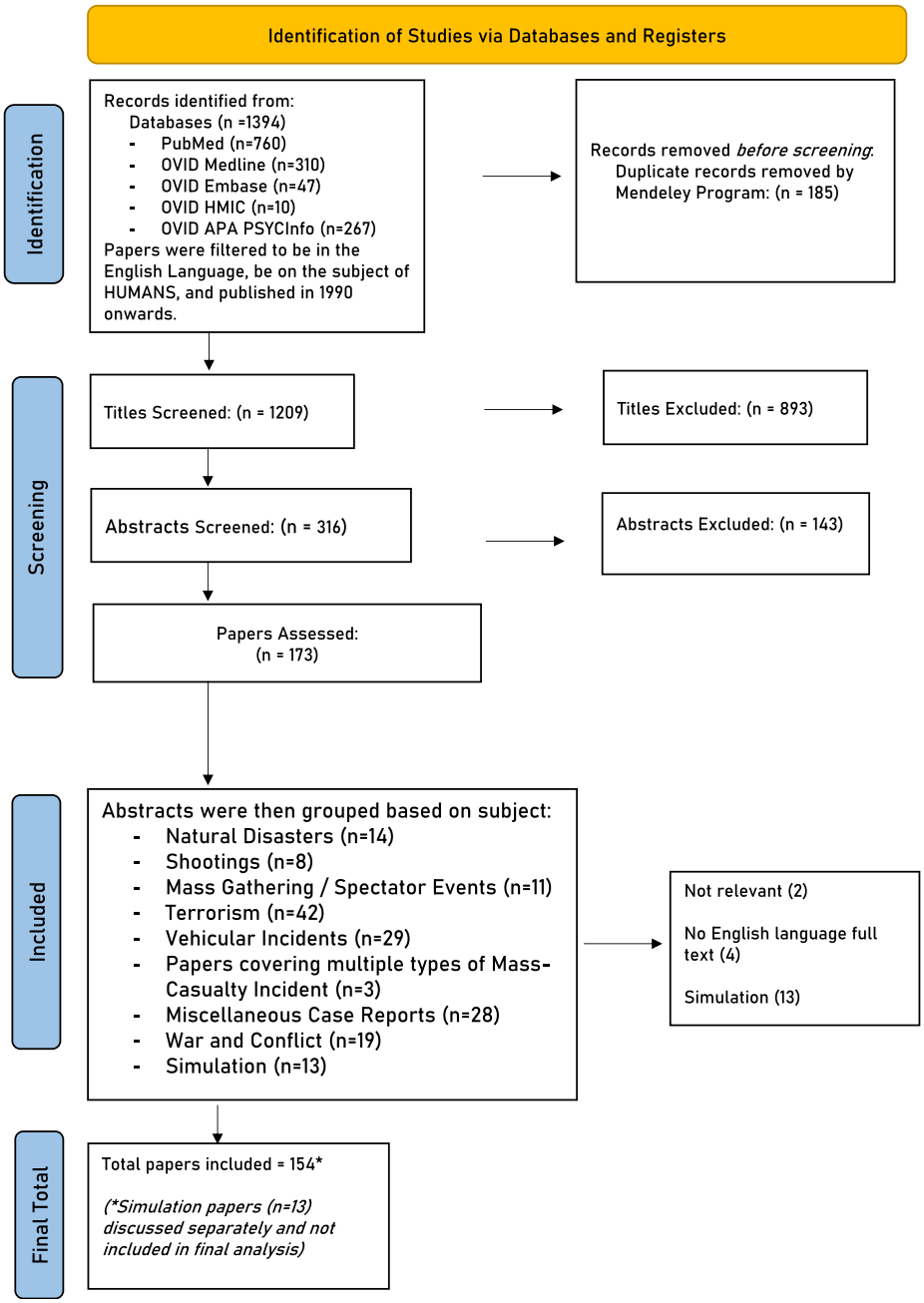

Figure 3. PRISMA Diagram.

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	Total Papers	Number of Reported Injuries	Number of Reported Deaths
Mass Gathering	11	19,460	7,511
Miscellaneous	28	17,098	659
Multiple Types	3	43,453	2,020
Natural Disasters	14	19,132	3,354
Shootings	8	773	268
Terrorism	42	43,906	3,343
Vehicular Incidents	29	4,851	505
War and Conflict	19	21,059	925
Total	154	169,732	18,585

Table 2. Overall Data by MCI Subtype
Abbreviation: MCI, mass-casualty incident.

	Total Papers	Number of Reported Injuries	Number of Reported Deaths
African Regions	6	4,622	211
Region of the Americas	35	34,810	1,559
South East Asian Region	9	4,402	754
European Region	32	11,736	1,155
Eastern Mediterranean Region	37	62,005	3,117
Western Pacific Region	35	52,157	11,789
Totals	154	169,732	18,585

Table 3. Overall Data by WHO Region
Abbreviation: WHO, World Health Organization.

Bespoke form used and provided	Bespoke form used but not provided	No bespoke form used	Review paper, authors not involved in primary data collection	Other	Total
2	6	4	16	1	29

Figure 4. Author Responses to Request for Further Detail on Use of Forms for Data Collection.

possible, but the volume of data collected minimized any potential effect and still allowed for a clear impression of current practice to be formed.

Main Scoping Review

The 154 manuscripts yielded a large amount of data - references for each paper are displayed in Appendix 1 (available online only).

This study covered MCIs over a period of 32 years, located in 42 countries from Africa, Asia, Europe, North America, Oceania, South America, and the Arctic. The number of injured persons involved in the MCI were listed by 94.8% of papers (146), and 89.6% (138) listed how many of these were fatalities. A total of 169,732 casualties were recorded in the data, as well as 18,585 recorded deaths. A further breakdown of this is presented by both subtype of MCI in Table 2 and by World Health Organization (WHO; Geneva, Switzerland) region in Table 3.

Data for publication were derived from a variety of contexts, either prehospital, in-hospital, by a designated research team, or a combination of these three groups. A more detailed breakdown of who collected the data is displayed by subtype of MCI in Table 4 and by WHO region in Table 5. Prehospital data collection was rare, and only three papers did not make clear where their data had been collected.

Whether data for the MCI had been gathered contemporaneously or retrospectively was also recorded. A small proportion (3.4%) had a mixture of the two, but there was roughly an equal split between these two methods. This is illustrated when further broken down by MCI subtype as displayed in Table 6 and by WHO region as shown in Table 1.

Table 7 shows all data categories recorded in all the mass-casualty events covered by all 154 papers included in this study. The categories of data are ordered from most to least frequent by percentage. Further breakdown by subcategory and WHO region is also displayed in Table 8. For a copy of the data in full, please contact the authors.

Author Contact

Of the 154 corresponding authors, 123 (80%) were contactable. A total of 29 responses (24%) were received. These responses are summarized in Figure 4.

Two authors reported having used bespoke data collection forms during the MCI response. One was used within the hospital setting and captured data including patient demographics, arrival sequence, and injury details but did not include any information on investigations or interventions. The second was used in a household survey in the aftermath of the 2010 Haiti earthquake and captured detailed data on earthquake-related injury and mortality, medical interventions, as well pre- and post-earthquake living and economic conditions. A third author used a bespoke form which they were able to provide, however this was sent to treating hospitals in the aftermath of the MCI, rather than used "at the front door." This form enabled thorough documentation of injuries, investigations, and treatments received, as well as relevant medical history at a time when this information was more likely to be available.

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	Prehospital Team	In-Hospital Team	Prehospital Team and In-Hospital Team	Research Team	In-Hospital Team and Researchers	Prehospital Team and Researchers	Unknown
Mass Gathering	18.2%	27.3%	45.5%	0.0%	0.0%	0.0%	9.1%
Miscellaneous	0.0%	64.3%	21.4%	7.1%	7.1%	0.0%	3.2%
Multiple Types	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%	0.0%
Natural Disasters	0.0%	57.1%	7.1%	35.7%	0.0%	0.0%	0.0%
Shootings	0.0%	37.5%	0.0%	62.5%	0.0%	0.0%	0.0%
Terrorism	4.8%	16.7%	16.7%	57.1%	4.8%	0.0%	0.0%
Vehicular Incidents	0.0%	44.8%	3.4%	31.0%	17.2%	3.4%	0.0%
War and Conflict	0.0%	47.4%	5.3%	31.6%	15.8%	0.0%	0.0%
Total (n)	4	61	21	54	9	3	2
Total (%)	2.6%	39.6%	13.6.0%	35.1%	5.8%	1.9%	1.3%

Table 4. Who Collected the Data

	Prehospital Team	In-Hospital Team	Prehospital Team and In-Hospital Team	Research Team	In-Hospital Team and Researchers	Prehospital Team and Researchers	Unknown
African Regions	0.0%	50.0%	0.0%	17.0%	33.0%	0.0%	0.0%
Region of the Americas	0.0%	34.3%	8.6%	48.6%	5.7%	2.9%	0.0%
South East Asian Region	0.0%	44.0%	11.0%	22.0%	22.0%	0.0%	0.0%
European Region	3.0%	44.0%	19.0%	22.0%	13.0%	0.0%	0.0%
Eastern Mediterranean Region	5.4%	29.7%	8.1%	51.4%	0.0%	5.4%	0.0%
Western Pacific Region	2.9%	45.7%	22.9%	25.7%	0.0%	0.0%	2.9%
Totals	2.6%	39.6%	13.6%	35.1%	5.8%	1.9%	1.3%

Table 5. Who Collected the Data, by WHO Region Breakdown
Abbreviation: WHO, World Health Organization.

	Contemporaneous	Retrospective	Contemporaneous & Retrospective	Unknown
Mass Gathering %	63.6%	9.1%	18.2%	9.1%
Miscellaneous %	74.2%	6.5%	9.7%	3.2%
Multiple Types %	0.0%	100.0%	0.0%	0.0%
Natural Disasters %	64.3%	35.7%	0.0%	0.0%
Shootings %	37.5%	62.5%	0.0%	0.0%
Terrorism %	21.4%	78.6%	0.0%	0.0%
Vehicular Incidents %	48.3%	51.7%	0.0%	0.0%
War and Conflict %	36.8%	57.9%	5.3%	0.0%
Total %	46.1%	48.7%	4.5%	0.6%

Table 6. When Data Were Collected, by MCI Subtype
Abbreviation: MCI, mass-casualty incident.

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Six authors reported having used bespoke data collection forms but were unable to provide these. Of these papers, two reported that patient data were recorded directly onto electronic medical records and therefore blank forms could not be provided. In the other four cases, the paper records had been destroyed or the author no longer had access to them, and blank copies were unavailable.

Four authors reported that they did not use a bespoke data collection form. Of these, one reported that the hospital's usual clerking form was used, which was no longer in use. Sixteen authors reported having collected their data retrospectively from a combination of sources, including hospital records and, in some cases, follow-up patient interviews.

Discussion

The published literature demonstrates a wide variation in the data collected. There is also variation in who collects data for the purposes of publication. There is a roughly even split between data collected contemporaneously and data collected retrospectively. When looking at the overall data, terrorism and shootings are the largest subtypes. It is notable that these categories are predominantly made up of MCIs occurring more recently and in higher income countries. This may reflect more organized health care systems and better methods of data collection.

It was most common for the in-hospital teams and research teams to collect the data, very little were collected by prehospital teams. Around one-half of the data were collected retrospectively. This is a feature true for all subcategories of MCI and when looking at the data divided by WHO region. This heavy reliance on retrospectively collected data by research teams is perhaps unsurprising given the chaotic nature of MCIs and significant risk of incomplete data collection or loss of that collected.

The ten most common data categories collected were number of injuries (94.8%), number of deaths (89.6%), injury type (81.2%), cause of injury (79.9%), age (63.0%), sex (63.0%), treatment (62.3%), severity of injury (61.7%), outcome of injury (59.1%), and investigations/treatments given (55.8%). Most of these are broad descriptive pieces of information or relate to basic demographics. There is a relatively high recording of treatment and investigations within this data set. However, there is relative paucity of data on vital signs, prehospital care, and long-term rehabilitation. This is a feature of the data when viewed as a whole, when viewed by WHO region, or when viewed by category of MCI. There is lack of standardization in recording MCIs globally. This variation is clearly reflected by the fact that the majority of discrete categories of recorded data (50 out of 64) were each observed in fewer than 10% of studies.

Contacted authors highlighted how challenging record keeping in MCIs can be. One author reported that "the influx of patients rendered the IT system inoperable and [we] had to rely exclusively on paper files." Another reported that ensuring accuracy and continuity of record keeping was particularly challenging at the interface of prehospital care and the emergency department, as their MCI prehospital and in-hospital patient ID systems differed, leading to much confusion and loss of patient information. Another author reported that very few patients had any formal trauma call documentation despite this system being in place at the time. These experiences may explain the heavy reliance on retrospective data collection seen in this study.

Simulation Papers

One key goal of this study is to understand current practice. Therefore, the subset of simulation papers is potentially revealing of the ideals of data collection which are drilled out with the real-life setting. All data in all 13 simulation papers were entirely collected by researchers, and were predominantly contemporaneously recorded, which would skew the overall totals had they been included in the main analysis. Within this category, the two most prevalent categories of data were number of injuries (69.2%) and triage status (76.9%). Triage status is much less commonly reported in all the non-simulation papers (2.6%). This may be reflective of the fact that MCI simulation papers are more focused on preparedness and initial triage, rather than other details of emergency health care delivery and longer-term management. What it also suggests is a mismatch between the emphasis of recording in the preparation phase compared to a real MCI. This raises the question as to whether a realignment in needed for how *ideal* is drilled, so that it reflects the important data (if this is indeed reflected in what teams choose to publish about real-life MCIs). Alternatively, perhaps there is a need to look at this simulation versus real-life discrepancy and question how it can be ensured that it reflects the ideal in real life. All of this calls into question what truly needs to be considered to be ideal and important MCI data.

Limitations

There are several limitations to this scoping review. There is a potential gap between published and recorded/attempted recorded data in MCIs, such that in most publications, it is not clear how much lost data there might be or what decisions were made with respect to including/discarding data points. This is especially true when considering the challenges associated with contemporaneous data collection. The English language filter is likely to have missed some significant publications, especially with respect to those in the Chinese language without an English language abstract. In reviewing each publication, identifying each of the collected data points was challenging because of the way in which they were presented across all of the papers in both narrative text and tabulated data fields. It is possible some were missed. That said, across the 154 publications, if any were omitted, it is likely this did not impact on the overall impression of data points. Some data point descriptions were subject to a level of interpretation on the part of the research team, but again, it is likely that the volume of data would mitigate the effect of this. A significant bias within the data is the tendency for publications repeatedly arising from the same locations.

It was hoped that contacting the authors of the studies involved would provide a mechanism to minimize any gaps in this data and increase the reliability of the findings. Though the response rate was less than anticipated, the information gained still has significance. The narratives and themes from the responses received do serve to illustrate the practical difficulties faced by those gathering data in MCIs.

Conclusion

Data collection in MCIs is challenging and heavily reliant on retrospective analysis. Data are often descriptive or demographic in nature. Simulation and training are heavily focused on triage, whereas in practice prehospital data are poorly reported. Current practice lacks standardization. Methods and minimum standards of practice in data collection must be improved if there is to be increased professionalism and accountability in the delivery of health care in MCIs. In order to achieve this, recommendations include:

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- Internationally agreed minimum data set which reflects a robust process of narrowing down and prioritizing the most important data categories both for utility acutely and post-MCI;
- Review of MCI simulation and preparation with realistic drilling of documentation practice and quality assurance procedures in place post-MCI which feed into the preparation phase; and
- Detailed understanding of MCI data collection challenges in order to develop processes with the pathway of least resistance and therefore a higher likelihood of more accurate data collection.

Author Contributions

SA initially worked on this project whilst supervised by AJ. MP then took the lead on this scoping review, expanding the scope and re-running the searches. JH was involved in contacting authors and synthesizing this section work into the body of the main project. MP led and wrote up the final manuscript with input from JH and AJ. All authors provided critical feedback and helped shape the format, analysis, and manuscript. AJ is guarantor for the paper.

Supplementary Materials

To view supplementary material for this article, please visit https://doi.org/10.1017/S1049023X25000111

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	Mass Gathering	Misc.	Multiple Types	Natural Disasters	Shootings	Terrorism	Vehicular Incident	War and Conflict	Total
Number of Injuries	81.8%	100.0%	66.0%	85.7%	100.0%	92.9%	100.0%	65.5%	94.8%
Number of Deaths	81.8%	96.4%	66.0%	64.3%	100.0%	90.5%	100.0%	55.2%	89.6%
Injury Type	72.7%	85.7%	66.0%	78.6%	87.5%	81.0%	79.3%	55.2%	81.2%
Cause of Injury	90.9%	92.9%	33.0%	71.4%	75.0%	78.6%	75.9%	51.7%	79.9%
Age	72.7%	85.75	66.0%	42.9%	50.0%	59.5%	58.6%	37.9%	63.0%
Sex	72.7%	82.1%	66.0%	42.9%	50.0%	54.8%	62.1%	44.8%	63.0%
Treatment	18.2%	71.4%	33.0%	57.1%	50.0%	69.0%	58.6%	51.7%	62.3%
Severity of Injury	72.7%	75.0%	66.0%	42.9%	75.0%	57.1%	51.7%	44.8%	61.7%
Outcome of Injury	45.5%	82.1%	33.0%	50.0%	62.5%	50.0%	58.6%	41.4%	59.1%
Investigations	9.1%	46.4%	0.0%	50.0%	50.0%	66.7%	69.0%	44.8%	55.8%
Mode of Transport	54.5%	82.1%	33.0%	21.4%	25.0%	31.0%	69.0%	27.6%	49.4%
Demographic	45.5%	75.0%	33.0%	35.7%	25.0%	23.8%	27.6%	31.0%	39.6%
Cause of Death	27.3%	64.3%	33.0%	35.7%	62.5%	26.2%	34.5%	10.3%	36.4%
Length of Stay in Hospital/ Rehabilitation Facility	9.1%	42.9%	33.0%	35.7%	25.0%	40.5%	44.8%	17.2%	36.4%
Time of Arrival at Health Care Facility	0.0%	0%	0.0%	0.0%	0.0%	9.3%	13.8%	5.3%	8.4%
Place of Injury/ Illness	27.3%	3.6%	0.0%	6.7%	0.0%	4.7%	10.3%	10.5%	7.8%
Related to Incident	9.1%	7.1%	0.0%	0.0%	0.0%	2.3%	10.3%	15.8%	7.1%
Vital Signs	0.0%	3.6%	0.0%	0.0%	0.0%	7.0%	6.9%	0.0%	7.1%
Specialty of Illness/Injury	9.1%	3.6%	0.0%	0.0%	12.5%	0.0%	10.3%	5.3%	6.5%
Civilian/ Professional Role	9.1%	3.6%	0.0%	6.7%	0.0%	4.7%	3.4%	21.1%	6.5%
Time of Injury	18.2%	3.6%	25.0%	6.7%	0.0%	0.0%	10.3%	5.3%	4.5%
Staffing	9.1%	3.6%	0.0%	0.0%	0.0%	2.3%	3.4%	0.0%	3.9%
Distance from Scene of Hospital	0.0%	3.6%	0.0%	0.0%	0.0%	2.3%	10.3%	5.3%	3.9%
Blood Use	0.0%	0.0%	0.0%	0.0%	12.5%	7.0%	3.4%	0.0%	3.9%
Prehospital Care Time	9.1%	0.0%	0.0%	0.0%	0.0%	0.0%	6.9%	5.3%	3.2%

Table 7. Categories of Data Collected by MCI Subtype *(continued)*

	Mass Gathering	Misc.	Multiple Types	Natural Disasters	Shootings	Terrorism	Vehicular Incident	War and Conflict	Total
Burns Specific Detail	0.0%	3.6%	0.0%	6.7%	0.0%	7.0%	0.0%	0.0%	3.2%
Arrival Time of Responders	0.0%	0.0%	0.0%	0.0%	0.0%	2.3%	10.3%	0.0%	3.2%
Triage	0.0%	0.0%	0.0%	0.0%	0.0%	4.8%	6.9%	0.0%	2.6%
Rate of Arrival at Hospital	18.2%	7.1%	0.0%	0.0%	0.0%	0.0%	6.9%	0.0%	2.6%
Bed Availability	0.0%	3.6%	0.0%	0.0%	0.0%	2.3%	6.9%	0.0%	2.6%
Procedure Length	0.0%	14.3%	0.0%	6.7%	12.5%	0.0%	0.0%	0.0%	2.6%
PMH (of Victim)	9.1%	3.6%	0.0%	7.1%	0.0%	0.0%	0.0%	0.0%	1.9%
Avoidable Death	0.0%	3.6%	0.0%	0.0%	12.5%	0.0%	0.0%	0.0%	1.9%
Residence	9.1%	3.6%	0.0%	6.7%	0.0%	0.0%	0.0%	0.0%	1.3%
6-Month Outcome	0.0%	7.1%	0.0%	0.0%	0.0%	2.3%	0.0%	0.0%	1.3%
Psychosocial Context	0.0%	3.6%	0.0%	0.0%	0.0%	2.3%	0.0%	0.0%	1.3%
OR Occupancy	0.0%	3.6%	0.0%	0.0%	0.0%	2.3%	0.0%	0.0%	1.3%
Time of Rx	0.0%	3.6%	0.0%	0.0%	12.5%	0.0%	0.0%	0.0%	1.3%
Insurance Status	0.0%	0.0%	0.0%	6.7%	0.0%	0.0%	3.4%	0.0%	1.3%
Lab Results	0.0%	0.0%	0.0%	0.0%	0.0%	4.7%	0.0%	0.0%	1.3%
Distance from Scene of Ambulance	0.0%	3.6%	0.0%	0.0%	0.0%	0.0%	3.4%	0.0%	1.3%
Prehospital Care Given	9.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.6%
Time in Different Areas	9.1%	10.7%	25.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.6%
Area Admitted To	0.0%	3.6%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.6%
Disability	0.0%	0.0%	25.0%	6.7%	0.0%	0.0%	0.0%	0.0%	0.6%
Language	0.0%	0.0%	0.0%	0.0%	0.0%	2.3%	0.0%	0.0%	0.6%
Cost of Care	0.0%	3.6%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.6%

Table 7. *(continued)*. Categories of Data Collected by MCI Subtype
Abbreviations: MCI, mass-casualty incident; OR, operating room; PMH, past medical history.

	African Regions	Region of the Americas	South East Asian Region	European Region	Eastern Mediterranean Region	Western Pacific Region	Total
Number of Injuries	100.0%	94.3%	88.9%	96.9%	97.3%	91.4%	94.8%
Number of Deaths	83.3%	85.7%	77.8%	93.8%	94.6%	88.6%	89.6%
Injury Type	83.3%	80.0%	88.9%	93.8%	75.7%	71.4%	81.2%
Cause of Injury	83.3%	74.3%	77.8%	93.8%	70.3%	80.0%	79.9%
Age	100.0%	54.3%	66.7%	65.6%	54.1%	71.4%	63.0%
Sex	100.0%	54.3%	55.6%	62.5%	59.5%	71.4%	63.0%
Treatment	66.7%	48.6%	55.6%	78.1%	70.3%	51.4%	62.3%
Severity of Injury	33.3%	57.1%	22.2%	68.8%	67.6%	68.6%	61.7%
Outcome of Injury	66.7%	57.1%	44.4%	65.6%	56.8%	57.1%	59.1%
Investigations	50.0%	45.7%	44.4%	71.9%	70.3%	40.0%	55.8%
Mode of Transport	16.7%	45.7%	22.2%	37.5%	51.4%	74.3%	49.4%
Demographic	33.3%	42.9%	55.6%	21.9%	40.5%	48.6%	39.6%
Cause of Death	50.0%	37.1%	33.3%	31.3%	29.7%	45.7%	36.4%
Length of Stay in Hospital/ Rehabilitation Facility	33.3%	31.4%	22.2%	37.5%	40.5%	40.0%	36.4%
Time of Arrival at Health Care Facility	0.0%	8.6%	0.0%	0.0%	2.7%	5.7%	8.4%
Place of Injury/ Illness	0.0%	11.4%	11.0%	3.1%	2.7%	5.7%	7.8%
Related to Incident	0.0%	8.6%	22.0%	9.4%	5.4%	5.7%	7.1%
Vital Signs	0.0%	0.0%	0.0%	3.1%	5.4%	14.3%	7.1%
Specialty of Illness/ Injury	0.0%	8.6%	0.0%	6.3%	2.7%	0.0%	6.5%
Civilian/ Professional Role	0.0%	8.6%	22.0%	0.0%	8.1%	5.7%	6.5%
Time of Injury	0.0%	8.6%	0.0%	6.3%	2.7%	2.9%	4.5%
Staffing	0.0%	11.4%	0.0%	0.0%	0.0%	5.7%	3.9%
Distance from Scene of Hospital	17.0%	2.9%	0.0%	3.1%	5.4%	5.7%	3.9%
Blood Use	0.0%	2.9%	0.0%	0.0%	5.4%	0.0%	3.9%
Prehospital Care Time	0.0%	0.0%	22.0%	0.0%	2.7%	5.7%	3.2%
Burns Specific Detail	17.0%	0.0%	0.0%	0.0%	2.7%	5.7%	3.2%
Arrival Time of Responders	0.0%	5.7%	0.0%	3.1%	2.7%	0.0%	3.2%
Triage	0.0%	0.0%	0.0%	9.0%	8.1%	0.0%	2.6%

Table 8. Categories of Data Collected by WHO Region *(continued)*

	African Regions	Region of the Americas	South East Asian Region	European Region	Eastern Mediterranean Region	Western Pacific Region	Total
Rate of Arrival at Hospital	0.0%	5.7%	0.0%	18.8%	0.0%	0.0%	2.6%
Bed Availability	17.0%	0.0%	0.0%	3.1%	0.0%	5.7%	2.6%
Procedure Length	0.0%	2.9%	0.0%	12.5%	2.7%	5.7%	2.6%
PMH (of Victim)	0.0%	2.9%	0.0%	3.1%	0.0%	2.9%	1.9%
Avoidable Death	0.0%	2.9%	0.0%	3.1%	0.0%	5.7%	1.9%
Residence	0.0%	2.9%	0.0%	3.1%	0.0%	0.0%	1.3%
6-Month Outcome	0.0%	0.0%	0.0%	0.0%	0.0%	2.9%	1.3%
Psychosocial Context	0.0%	0.0%	0.0%	3.1%	0.0%	2.9%	1.3%
OR Occupancy	0.0%	0.0%	0.0%	0.0%	0.0%	2.9%	1.3%
Time of Rx	0.0%	2.9%	0.0%	3.1%	0.0%	0.0%	1.3%
Insurance Status	0.0%	5.7%	0.0%	0.0%	0.0%	0.0%	1.3%
Lab Results	0.0%	0.0%	0.0%	6.3%	0.0%	0.0%	1.3%
Distance from Scene of Ambulance	0.0%	2.9%	0.0%	6.3%	0.0%	2.9%	1.3%
Prehospital Care Given	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.6%
Time in Different Areas	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.6%
Area Admitted To	0.0%	0.0%	0.0%	3.1%	0.0%	0.0%	0.6%
Disability	0.0%	2.9%	0.0%	0.0%	0.0%	0.0%	0.6%
Language	0.0%	0.0%	0.0%	3.1%	0.0%	0.0%	0.6%
Cost of Care	0.0%	0.0%	0.0%	0.0%	2.7%	0.0%	0.6%

Table 8. *(continued).* Categories of Data Collected by WHO Region
Abbreviations: WHO, World Health Organization; OR, operating room; PMH, past medical history.