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ORIGINAL RESEARCH

Assessing Data Completeness in Emergency Medical Team Reports: Analysis of the Response to Cyclone Idai in Mozambique using the WHO Minimum Data Set

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Abstract: **Introduction:** In 2017, WHO endorsed the Emergency Medical Team (EMT) Minimum Data Set (MDS) for real-time data collection during health emergencies. It was first activated during Cyclone Idai in Mozambique in 2019. The objective of the study is to evaluate the completeness of data collected by EMTs during the Cyclone Idai response in Mozambique. **Methods:** This study evaluated data completeness from Cyclone Idai, analyzing 277 daily reports with 18,468 patient consultations from 13 international teams between 27 March and 12 July, 2019. Completeness of team information, demographics, health events, disaster relation, and outcomes were compared across EMT types and classifications using box plots, Kruskal-Wallis, t-tests, and multivariable logistic regression. **Results:** During the 110-day response, 13 EMTs submitted 277 daily reports on patient information. Findings showed that, out of the 277 daily reports, demographic information was complete in 92.8% of reports, health event information in 62.1%, information on the relation of health events to disaster in 57.4%, and outcome data in 50.2%. Type 2 EMTs exhibited higher data completeness, likely due to greater resources and personnel, compared to Type 1 Mobile and Type 1 Fixed EMTs. Type 1 Fixed EMTs demonstrated lower completeness for outcomes, health events, and disaster relation, potentially due to heavier workloads. Type 1 Mobile EMTs likely benefited from enhanced training and frequent interactions with data managers, which may have contributed to their higher data completeness compared to Type 1 Fixed EMTs. Classified EMTs performed better overall. **Conclusion:** This study underscores the need for standardized training, and the data collection applications that enable the automatic inclusion of information such as geotags.

Keywords: Data collection; Data quality; Disasters; Information management; Emergency medical services

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1. Introduction

Disaster response is a critical aspect of public health and emergency management, requiring coordination of national and international agencies. A crucial component of effective disaster response is the collection and management of data, including patient data, which supports decision-making, resource allocation, and evaluation of response strategies(1). Ensuring data quality, particularly completeness, timeliness, and reliability, is essential, especially when collected by multiple international emergency medical teams (EMTs) operating under stressful and resource-limited conditions(2).

During recent decades, researchers have highlighted the need for improved reporting of disaster-related data, with a focus on comprehensiveness, timeliness, accuracy, and transparency. Standardized data collection methods among EMTs can address these needs. However, previous tools varied across EMTs, hindering data integration and accurate reporting to national authorities(3, 4).

To address this, in 2017, the World Health Organization (WHO) endorsed the EMT Minimum Data Set (MDS) as a standardized tool for disaster-related health data collection. It was developed as an international version of the Japanese Surveillance in Post Extreme Emergencies and Disasters (J-SPEED)(5), which was adapted from the Philippine's SPEED system(6). The EMT MDS (hereinafter MDS) was first implemented during the response to Cyclone Idai, a devastating storm with massive destruction and a humanitarian crisis in Mozambique, Zimbabwe, and Malawi in March 2019, when 13 foreign EMTs used this tool for collecting patient data. Since then, it has been used in more than ten addi-

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tional international health emergencies. However, to date, no formal assessment has been conducted on the quality of data collected using this tool. Two systematic reviews, one analyzing 34 studies (2000–2015)(7) and another 97 studies (2011–2021)(8) identified key data quality dimensions related to emergency medical services: accuracy, completeness, timeliness, accessibility, reliability, linkage, and consistency.

This study aims to evaluate the completeness of data collected by EMTs during the Cyclone Idai response, focusing on organizational information, temporal factors, location data, patient demographics, and health events, and their relation to disaster and patient outcomes.

2. Methods

2.1. Study design and data source

This descriptive comparative study analyzed patient data collected by international EMTs during the 2019 Cyclone Idai response in Mozambique. This study evaluated data completeness from Cyclone Idai, analyzing 277 daily reports with 18,468 patient consultations from 13 international teams between 27 March and 12 July, 2019. Completeness of team information, demographics, health events, disaster relation, and outcomes was compared across EMT types and classifications using box plots, Kruskal-Wallis, t-tests, and multivariable logistic regression.

In this study, only aggregated daily data were available, limiting our ability to assess data accuracy at the individual level. Furthermore, most teams didn't report time of data entry, preventing assessment of the time gap between patient consultation and reporting. Accordingly, completeness was evaluated using predefined criteria (Figure 1).

Approval for ethical review was obtained from Hiroshima University (Hiroshima, Japan; approval number: E-2059).

2.2. Participants

A total of 277 daily reports containing information on 18,468 patient consultations were included. These reports were submitted by 13 international EMTs. Five daily reports submitted by one EMT deployed for a specialized non-clinical role were excluded, as they contained no patient consultation data.

2.3. Data gathering

Cyclone Idai made landfall near Beira City (Sofala Province) on March 14–15, 2019. International EMTs deployed soon after. The EMT Coordination Cell (EMTCC) of Mozambique mandated the use of the MDS form from March 31. Fourteen international EMTs deployed from March 27 to July 12 used this reporting system with technical support from WHO and the Japan Disaster Relief Expert Team.

The MDS tool (Supplementary Table 1) has 85 items across four sections: Team Information (14 items, a–n), Daily Summary (6 items, o–t), MDS Statistics (50 items; No.1–No.50), and Needs and Risks (15 items; No.51–No.65). EMT staff manually complete the first three sections, while MDS Statistics is populated by a data manager using consultation-level data. All patient information was anonymous. Additional details are available online(9, 10).

Reports (Excel or paper) were compiled using the EMTCC-provided "MDS Maker" tool generating CSV files and submitted via email. Some EMTs used their own IT systems. In cases where internet was unavailable, teams hand-delivered reports. Upon receiving the daily reports, either in Excel or paper format, we first checked for duplicate entries, though such cases were minimal. For paper-based submissions, we contacted each team to confirm any unclear or potentially inaccurate information. Afterwards, these were converted to CSV format by the Japan-based EMT MDS off-site support team, which also provided remote analytical assistance.

2.4. Outcome measures

Data completeness across four components: "Who" (organization/team details or contact information), "When" (activity date), "Where" (state, city, village, facility name, or geotag), and "What" (demographics, health events, relation to disaster, outcomes) was considered as the main outcome measure. For "Who", "When" and "Where", completeness required at least one sub-item. For "What", we flagged missing data if demographic or health event records were fewer than reported cases. Completeness percentages were calculated for eight MDS items: team information, contact information, activity date, location, demographics, health events, disaster-relatedness, and patient outcomes. The sub-items under each of the eight categories and the criteria used to assess completeness are detailed in Figure 1, and the MDS form is presented in Supplementary Figure 1.

2.5. Statistical analysis

Statistical analyses were conducted across EMT type (Type 1 Mobile, Type 1 Fixed, Type 2) and classification (WHO-classified or non-classified). EMTs are classified by complexity of care: i) Type 1 Mobile (≤20 staff, up to 50 outpatients/day across multiple sites); ii) Type 1 Fixed (≤30 staff, up to 100 outpatients/day); iii) Type 2 (≤70 staff, 1 operating room, ≥7 major or 15 minor surgeries/day), and iv) Type 3 (advanced orthopedic and reconstructive wound care)(11). WHO-classified EMTs are verified to meet global standards for patient care and operational capacity(12).

Box plots and pairwise statistical comparisons (Kruskal-Wallis test and a t-test) were conducted to compare the completeness by EMT type and EMT classification. The Kruskal–Wallis test was used because the data violated normality and homogeneity of variance assumptions, as assessed by the Shapiro–Wilk and Bartlett's tests. Post hoc comparisons were conducted using Dunn's test with Bonferroni correction.

Multivariable logistic regression (conventional or Firth) was performed to identify the associations between overall data completeness and day of response, number of consultations, EMT type, EMT classification and completeness of data for demographics, health events, their relation to the disaster, and patient outcome. In cases where data was zero or too small for Type 2 EMTs, conventional logistic regression could not be applied due to the complete separation problem(13). Firth regression addressed complete separation where conventional models failed, using penalized likelihood to stabilize estimates(14). Multivariable linear regression (with robust standard errors due to non-normal residuals)(15) was performed to identify the factors (day of response, number of consultations, EMT type, and EMT classification) associated with the overall data completeness.

Given that many important factors (staff workload, training on EMT MDS, team management, etc.) influencing data completeness were not captured in our dataset, the primary aim of regression analysis was explanatory rather than predictive. All statistical analyses were conducted using STATA version 17.1 (StataCorp; College Station, TX, USA).

3. Results

3.1. General characteristics of EMT reports

During the 110-day response, 13 EMTs submitted 277 daily reports on patient information to the EMTCC. Table 1 summarizes 277 daily reports submitted from March 27 to July 12, 2019, by 13 EMTs: three Type 1 Mobile, seven Type 1 Fixed, and three Type 2. In total, 18,468 health events were recorded: 2089 by Type 1 Mobile, 12,964 by Type 1 Fixed, and 3415 by Type 2 EMTs. Average daily patient consultations per EMT were 52 (Type 1 Mobile), 75 (Type 1 Fixed), and 66 (Type 2).

3.2. Data completeness by EMT type and classification

Table 2 shows the percentage of data completeness by EMT type and classification. Of the 277 reports, 51 were from Type 1 Mobile EMTs, 174 from Type 1 Fixed, and 52 from Type 2. WHO-classified EMTs submitted 104 reports and non-classified EMTs submitted 173 reports. All EMTs fully reported team information, contact details, and date of activity. Location data were also 100% complete, with 99.6% completeness for the “state”, but lower rates for other location categories (57.0% to 99.6%). Facility name was reported in only 54.9% of reports overall, although Type 2 EMTs achieved 100% completeness in this category. Geo-tagging was under-reported (57.0%), with higher rates in non-classified EMTs (64.2%) than in classified EMTs (45.2%).

Demographics (age, sex) were 92.8% complete overall; Type 1 Mobile EMTs had the lowest (78.4%) and Type 2 EMTs had the highest (100%) percentage. Health event completeness was 62.1% overall; Type 2 EMTs had the highest (100%) and Type 1 Fixed EMTs had the lowest (46.0%), and classified EMTs had a higher rate (79.8%) than non-classified EMTs (51.4%). Data on the relation to the disaster had an overall completeness of 57.4%; Type 2 EMTs had the highest (82.7%) and Type 1 Fixed EMTs had the lowest (47.1%), and classified EMTs had a higher rate (68.3%) than non-classified EMTs (50.9%). Outcome-related data had the lowest overall completeness (50.2%); Type 1 Fixed EMTs had the lowest (43.1%), and non-classified EMTs (46.2%) had a lower rate than classified EMTs (56.7%).

3.3. Overall completeness according to EMT type and classification

Figure 2 presents box plots and pairwise comparisons of overall data completeness by EMT type (left) and classification (right). The Type 1 Mobile EMTs showed the greatest variability (range: 50%–100%, an interquartile range (IQR):75% –100%, median:100%). Type 1 Fixed EMTs had a range of 62.5%–100%, median:75%, IQR:62.5% –100%. Type 2 EMTs had the least variability (range:75% –100%, median:100%, IQR: 87.5% –100%). Dunn’s post hoc test found that Type 1 Fixed EMTs had significantly lower completeness than Type 1 Mobile (z = 2.96, p = 0.005) and Type 2 (z = 5.44, p < 0.001). No significant difference was observed between Type 1 Mobile and Type 2 EMT (z = 1.98, p = 0.072). Non-classified EMTs had a mean completeness of 80.5% (range:62.5% –100%, median: 75%, IQR:62.5% –100%), while classified EMTs had 86.8% (range: 50% –100%, median: 100%, IQR: 75% –100%). A pairwise comparison showed that these two groups were significantly different (Mean difference= 6.3%; p = 0.0019).

3.4. Multivariate analysis

Table 3 shows the results of a multivariate analysis. For demographic completeness, day of response was positively associated (adjusted odds ratio (AOR) = 1.14, 95%CI: 1.06-1.22, p = 0.001), and the number of consultations had a slight negative effect (AOR = 0.98, 95%CI: 0.97-1.00, p = 0.019). Type 1 Mobile EMTs were less likely to report demographic data (AOR = 0.16, 95%CI: 0.05-0.51, p = 0.002) compared to Type 1 Fixed EMTs. There were no significant differences between Type 1 Fixed and Type 2 EMTs (p = 0.162) or between non-classified and classified EMTs (p = 0.114).

For health event data, Type 1 Mobile (AOR = 5.47, 95%CI: 2.46-12.19, p < 0.001) and Type 2 EMTs (AOR = 143.24, 95%CI: 8.63-2376.92, p = 0.001) were more likely to report these data than Type 1 Fixed EMTs. Classified EMTs (AOR = 3.88, 95%CI: 2.12-7.11, p < 0.001) were more likely to report health event data than non-classified EMTs. Similar trends were seen in disaster relatedness: Type 1 Mobile (AOR = 2.93, 95%CI: 1.40-6.14, p = 0.004) and Type 2 EMTs (AOR = 5.96, 95%CI: 2.66-13.36, p < 0.001) were more likely to report these data than Type 1 Fixed EMTs. Classified EMTs (AOR = 2.22, 95%CI: 1.27-3.90, p = 0.005) were more likely to report these data than non-classified EMTs. Outcome data showed a marginal negative effect with response day (AOR = 0.99, 95%CI: 0.98-1.00, p = 0.024), while Type 1 Mobile (AOR = 2.17, 95%CI: 1.06-4.41, p = 0.033) and Type 2 EMTs (AOR = 2.19, 95%CI: 1.13-4.24, p =

0.020) were more likely to report these data than Type 1 Fixed EMTs. Overall data completeness was higher for Type 1 Mobile and Type 2 EMTs (Coefficient = 7.64, 95%CI: 5.67-9.62, p < 0.001) and for classified EMTs (Coefficient = 6.75, 95%CI: 2.41-11.09, p = 0.002).

4. Discussion

The current analysis revealed moderate overall data completeness, with variation by EMT type, classification status and data category. All 13 EMTs fully reported team and contact information, which is crucial for effective coordination with local health authorities and international organizations(16). Team details also allow verification of team qualifications, capabilities and performance tracking and adherence to standards, ultimately contributing to improved overall data management(17).

Dates of activities were consistently reported. This information is essential for tracking the progression of health events over time and guiding decisions regarding resource allocation and intervention strategies (18). Location data were also marked as complete if any one field (e.g., state, city, village, facility, or geo-tag) was filled. However, this approach introduces variability in geographic precision. For instance, "state" provides a limited utility compared to more specific fields like "village" or "facility name"(19). This lack of granularity prevents pinpointing the exact location of a health event, which is particularly important for Type 1 Mobile EMTs. We found that geo-tagging was underreported (57%), especially by Type 1 EMTs. Since Type 2 EMTs were based in hospitals, they are not required to provide geo-tagging. Given the importance of precise mapping(20), other EMT types should be encouraged to provide geo-tags. Japan's J-SPEED app, which auto-collects geo-data, offers a useful model for developing a mobile MDS tool.

The overall completeness of demographic data (92.8%) was high, but reporting was lower for health events (62.1%), disaster-relatedness (57.4%), and outcomes (50.2%). Type 2 EMTs consistently outperformed others, likely due to smaller patient loads and greater resources(11). In addition, during a cyclone, patients are more likely to experience minor problems than serious conditions(21, 22). These teams saw an average of 66 patients per day, compared to 75 for Type 1 Fixed EMTs, which may have allowed them to devote more time for careful data entry.

Type 1 Mobile EMTs had more variable completeness but outperformed Type 1 Fixed EMTs in key categories such as health events and outcomes. Although the Type 1 Mobile units are smaller(11), their decreased workload compared to Type 1 Fixed EMTs may allow for more effective training of team members and better adherence to MDS reporting requirements. Additionally, more frequent interaction with EMTCC staff may have helped mobile teams improve reporting.

Among all studied items, the overall completeness percentages for the relationship of health events to the disaster (57.4%) and for patient outcome (50.2%) were very low. We hypothesize that this may reflect unclear definitions rather than staff capacity alone. To address these issues, the current research team is currently conducting a questionnaire survey among EMT members who have used the EMT MDS tool in an effort to identify areas that need improvement during the data collection process. Classified EMTs performed better overall than non-classified EMTs (86.8% vs. 80.5%), particularly in health event and disaster-related data. Multivariate analysis confirmed these differences. These results suggest that classified EMTs have more robust internal systems and protocols for data reporting. However, non-classified EMTs reported geo-tags more often (64.2% vs. 45.2%), suggesting that practices from both groups could inform improvements. It was found that several factors influenced the completeness of data reporting. The number of consultations had a small but statistically significant inverse relationship with the reporting of demographic information. This may suggest that high patient volumes can overwhelm EMTs and reduce their capacity to capture detailed patient information. In contrast, the day of response had a positive relationship with reporting of demographics, in that a longer response period was associated with better reporting. This may be because teams become more organized and efficient in their reporting processes over time.

While this study provides important insights into data completeness using the EMT MDS tool during the Cyclone Idai response, generalizing these findings to other disaster settings should be done with caution. Cyclone Idai was the first major event to implement the EMT MDS system, and EMTs may have had limited prior experience with the tool. Additionally, Mozambique's specific resource constraints, digital infrastructure, and contextual factors—such as limited mobile connectivity and reliance on paper-based reporting for some teams—may differ from other settings where digital tools and training systems are more advanced. In contrast, countries or regions with better digital preparedness and more experienced EMTs may achieve higher data completeness. Nonetheless, the patterns observed in this study—such as the better performance of classified EMTs and the inverse association between workload and data completeness—may still offer relevant lessons for improving EMT data systems in diverse contexts. Further research using data from more recent responses and varied geographic settings will be essential to assess the consistency and applicability of these findings.

The findings of this study highlight several areas of data reporting during emergency health responses that need improvement. First, regular training for all EMT types is essential to ensure more consistent data collection, particularly for Type 1 Fixed and Mobile EMTs, which showed greater variability and lower overall completeness. The consistently higher performance of classified EMTs underscores the value of adhering to international standards, and the practices of these classified teams could serve as a model for improving the reporting practices of all teams. Capacity-building programs that target non-classified EMTs could also help bridge the gap in data quality, particularly in critical areas such as reporting of health events and outcomes. Finally, providing feedback to individual EMTs on their data completeness could help them focus on specific areas that need the most improvement. Further studies should assess additional dimensions of data quality beyond completeness, including accuracy and timeliness, to provide a more comprehensive evaluation of EMT MDS performance. Expanding the assessment to include subsequent emergency responses will help determine whether data quality improves over time as teams gain experience.

5. Strengths and limitations

This study has strengths and limitations. This is the first study to examine data completeness for multiple types and classifications of EMTs, and this provides valuable insights into how different teams perform in terms of reporting health data during a disaster. Another strength is that this study was a comprehensive evaluation of data completeness using a standardized format that has only recently become available — the MDS tool.

A key limitation of this study is the reliance on aggregated data, which may obscure missing entries within subgroups. For instance, data were considered complete if the total number of health events matched the number of patient consultations, yet individual patients may have experienced multiple events or none at all. Without individual-level records, it is not possible to verify the completeness of event reporting per patient or to assess internal inconsistencies across variables. Future analyses using individual-level data will be essential to more accurately evaluate data completeness and reporting quality. Another potential limitation is reporting bias, wherein teams may have preferentially completed simpler fields, such as demographic information, while neglecting more complex or ambiguous ones, such as patient outcomes or the relationship of health events to the disaster. This selective reporting may reflect time constraints, unclear definitions, or a lack of familiarity with certain MDS categories. As a result, the observed completeness may overestimate the reliability of critical but more challenging data elements. Additional training and improved form design may help address these gaps in future deployments. Additionally, as Cyclone Idai was the first event to use the EMT MDS, individual-level data was not collected, a limitation that complicated the use of data cleaning. Future analyses should focus on individual-level data to ensure more accurate assessments. Most importantly, the current finding was based on a single case—Cyclone Idai that occurred in 2019. Because the EMT MDS was newly introduced during the 2019 Cyclone Idai response, teams were likely still becoming familiar with the tool. As EMTs gain experience and training in using the MDS, data completeness and quality may have improved in subsequent deployments. Therefore, the findings from this single early event may not reflect current performance levels. Longitudinal studies across multiple responses are needed to assess trends in data completeness and evaluate the impact of growing proficiency over time.

6. Conclusions

The present study of the completeness of EMT data during the Cyclone Idai response in Mozambique highlights the importance of robust data collection practices during emergency health responses. Although classified EMTs and higher-capacity EMTs performed better overall, there remain significant challenges, particularly for mobile and fixed Type 1 EMTs. Improving the consistency of reporting for all EMT types will be critical for ensuring that the health data collected during emergencies is accurate, complete, and actionable. These improvements will enhance immediate response efforts and contribute to better planning and preparedness for future disasters. Implementing a real-time data quality alert system could help improve overall data accuracy and completeness.

7. Declarations

7.1. Acknowledgments

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7.2. Funding

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7.3. Authors' contributions

Conceptualization: OC, TK; Methodology: OC, TK; formal analysis: OC; Investigation: OC, YT; Data curation: OC, TY; Writing – Original Draft: OC; Writing – Review & Editing: AF, IK, YT, YY, MC, IU, SF, RK, TK; Visualization: OC; Supervision: OC, TK; Funding acquisition: TK. All authors read and approved the final version of manuscript.

7.4. Competing interest

All authors have no competing interests to declare.

7.5. Ethical approval

Approval for ethical review was obtained from Hiroshima University (Hiroshima, Japan; approval number: E-2059).

7.6. Data statement

Permission from the Ministry of Health, Mozambique, and the Emergency Medical Teams, World Health Organization is required for data sharing.

7.7. Use of artificial intelligence chatbots

All authors declare that no artificial intelligence tools were used in the writing of this manuscript and in the creation of its figures.

7.8. List of abbreviations and symbols

AOR – Adjusted Odds Ratio
CI – Confidence Interval
EMT – Emergency Medical Team
EMTCC – Emergency Medical Team Coordination Cell
J-SPEED – Japanese Surveillance in Post Extreme Emergencies and Disasters
MDS – Minimum Data Set
WHO – World Health Organization

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Table 1: General characteristics of emergency medical team (EMT) reports during 27 March - 12 July 2019

Affected prefecture	**Values**
Number of EMT that reported data	
Total	13 (100)
Type of EMTs	
Type 1 mobile	3 (23)
Type 1 fixed	7 (54)
Type 2	3 (23)
EMT classification	
Classified	5 (38)
Non-classified	8 (62)
Number of daily reports	277 (100)
Type 1 mobile	51 (18)
Type 1 fixed	174 (63)
Type 2	52 (19)
Days of response	110 days
Type 1 mobile	27 days (28 March - 23 April)
Type 1 fixed	90 days (27 March - 12 July)
Type 2	29 days (30 March - 27 April)
Total number of patient consultations	18,468 (100)
Type 1 mobile	2,089 (11)
Type 1 fixed	12,964 (70)
Type 2	3,415 (19)
Average number of patient consultations per EMT per day[1]	
Type 1 mobile	52 ± 36.9
Type 1 fixed	75 ± 48.6
Type 2	66 ± 20.8

Data are presented as number (%) or mean ± standard deviation.
[1]An overall average was obtained by dividing the total number of consultations across all days by the total number of EMT team-days.

Table 2: Data completeness in different minimum data set (MDS) items by emergency medical team (EMT) types and classification

MDS items	**EMT types**				**Classified**	
	All type (n = 277)	**1 mobile (n = 51)**	**1 fixed (n = 174)**	**2 (n = 52)**	**Yes (n = 104)**	**No (n=173)**
Team information						
Total	277 (100.0)	51 (100.0)	174 (100.0)	52 (100.0)	104 (100.0)	173 (100.0)
Organization name	277 (100.0)	51 (100.0)	174 (100.0)	52 (100.0)	104 (100.0)	173(100.0)
Team name	277 (100.0)	51 (100.0)	174 (100.0)	52 (100.0)	104 (100.0)	173 (100.0)
Team information						
Total	277 (100.0)	51 (100.0)	174 (100.0)	52 (100.0)	104 (100.0)	173(100.0)
Contact person	277 (100.0)	51 (100.0)	174 (100.0)	52 (100.0)	104 (100.0)	173 (100.0)
Phone number	186 (67.1)	49 (96.1)	87 (50.0)	50 (96.2)	103 (99.0)	83 (48.0)
Email	275 (99.3)	51 (100.0)	174 (100.0)	50 (96.2)	103 (99.0)	172 (99.4)
Date of activity						
Total	277 (100.0)	51 (100.0)	174 (100.0)	52 (100.0)	104 (100.0)	173 (100.0)
Location						
Total	277 (100.0)	51 (100.0)	174 (100.0)	52 (100.0)	104 (100.0)	173 (100.0)
State	276 (99.6)	50 (98.0)	174 (100.0)	52 (100.0)	104 (100.0)	172 (99.4)
City	250 (90.3)	49 (96.1)	174 (100.0)	27 (51.9)	78 (75.0)	172 (99.4)
Village	224 (80.9)	29 (56.9)	169 (97.1)	26 (50.0)	57 (54.8)	167 (96.5)
Facility name	152(54.9)	22 (43.1)	78 (44.8)	52 (100.0)	81 (77.9)	71 (41.0)
Geo tag	158 (57.0)	35 (68.6)	123 (70.7)	0 (0.0)	47 (45.2)	111 (64.2)
Information on						
Demography (age, sex)	257 (92.8)	40 (78.4)	165 (94.8)	52 (100.0)	93 (89.4)	164 (94.8)
Health events	172 (62.1)	40 (78.4)	80 (46.0)	52 (100.0)	83 (79.8)	89 (51.4)
Relation#	159 (57.4)	34 (66.7)	82 (47.1)	43 (82.7)	71 (68.3)	88 (50.9)
Outcome	139 (50.2)	31 (60.8)	75 (43.1)	33 (63.5)	59 (56.7)	80 (46.2)

Data are presented as number (%); #: relation of health events to disaster.

Table 3: Multivariate analysis of the relationship of the day of response, number of consultations, emergency medical team (EMT) type, and EMT classification with data completeness

MDS items	Information on									
	Sex and age[1]		Health events[1]		Relation[2]#		Outcome[1]		Overall completeness[3]	
	AOR (95%CI)	P	AOR (95%CI)	P	AOR (95%CI)	P	AOR (95%CI)	P	Coefficient	P
Day of response										
Value	1.14 (1.06-1.22)	0.001	0.99 (0.98-1.00)	0.117	0.99 (0.98-1.00)	0.15	0.99 (0.98-1.00)	0.024	0.03 (-0.05-0.12)	0.443
Number of consultations										
Value	0.98 (0.97-1.00)	0.019	1.00 (0.99-1.00)	0.628	1.00 (1.00-1.01)	0.31	1.00 (1.00-1.01)	0.277	0.03 (-0.01-0.08)	0.134
Type of EMT										
1 fixed	Reference								7.64 (5.67-9.62)	<0.001
1 mobile	0.16 (0.05-0.51)	0.002	5.47 (2.46-12.19)	<0.001	2.93 (1.40-6.14)	0.004	2.17 (1.06-4.41)	0.033		
2	7.87 (0.44-142.0)	0.162	143.24 (8.63-2376.92)	0.001	5.96 (2.66-13.36)	<0.001	2.19 (1.13-4.24)	0.020		
Classification status										
Non-classified	Reference								6.75 (2.41-11.09)	0.002
Classified	0.45 (0.17-1.21)	0.114	3.88 (2.12-7.11)	<0.001	2.22 (1.27-3.90)	0.005	1.41 (0.82-2.42)	0.211		
Model fit statistics	Wald chi2(4) = 22.42, p = 0.0002		Wald chi2(4) = 27.54, p <0.001		Wald chi2(4) = 28.97, p <0.001		Wald chi2(4) = 13.94, p = 0.0075		p < 0.001; Adjusted, R2=0.11; Root MSE = 15.4	

Data are presented with 95% confidence interval (CI). All variables including Day of response, number of consultations, Type of EMTs and Classification status of EMTs are included in the model. AOR: Adjusted Odds Ratio; MSE: Mean Square Error; #: relation of health events to disaster.

1 Multivariable Firth logistic regression was conducted.

2 Multivariable conventional logistic regression was conducted.

3 Multivariable linear regression was used.

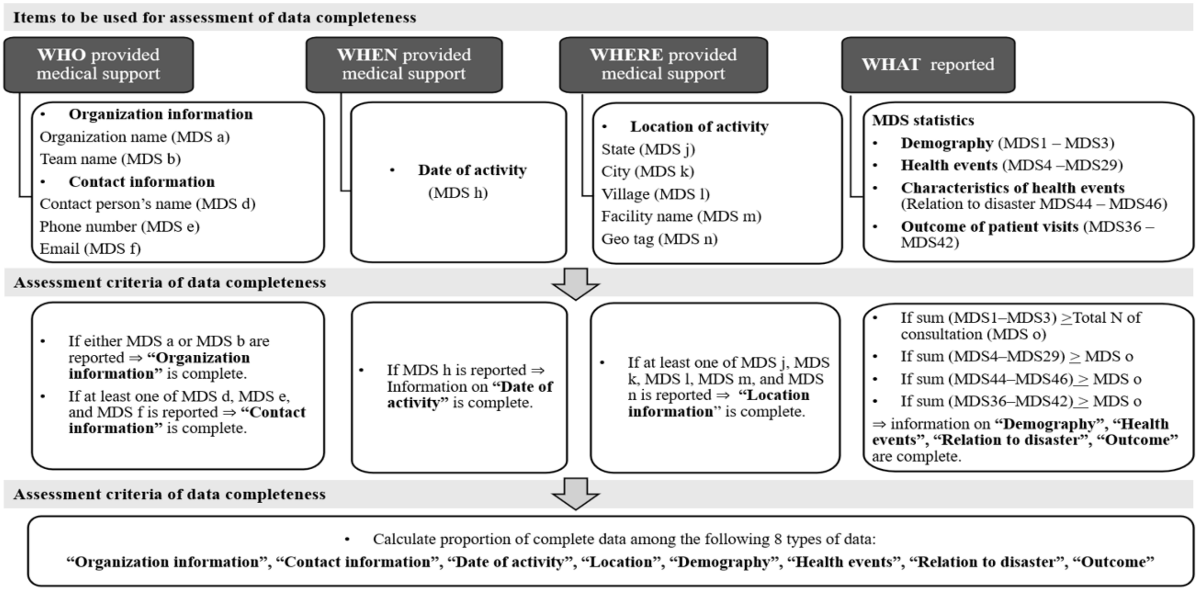


Figure 1: Framework for assessing the situation of emergency medical teams in minimum data set (MDS) completeness. Detailed information on MDS items are shown in Supplementary Figure 1.

1 MDS1-MDS3: Male, Female-Non-pregnant, Female.

2 MDS4-MDS29: Trauma (MDS4-MDS8), Infectious diseases (MDS9-MDS18), Additional items that will be included based on the current situation (MDS19-MDS22), Emergency (MDS23, MDS24), Other key diseases (MDS25-MDS29).

3 MDS44-MDS46: Directly related to event, indirectly related to event, not related to event.

4 MDS 36-MDS42: Discharge without medical follow-up, Discharge with medical follow-up, Discharge against medical advice, Referral, Dead on arrival, Death within facility.

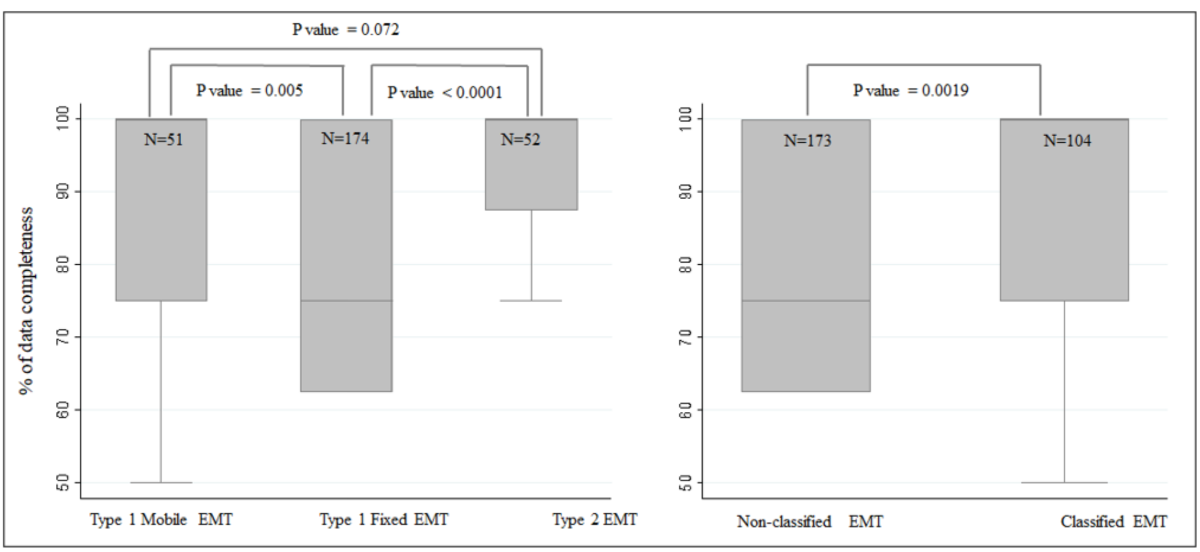
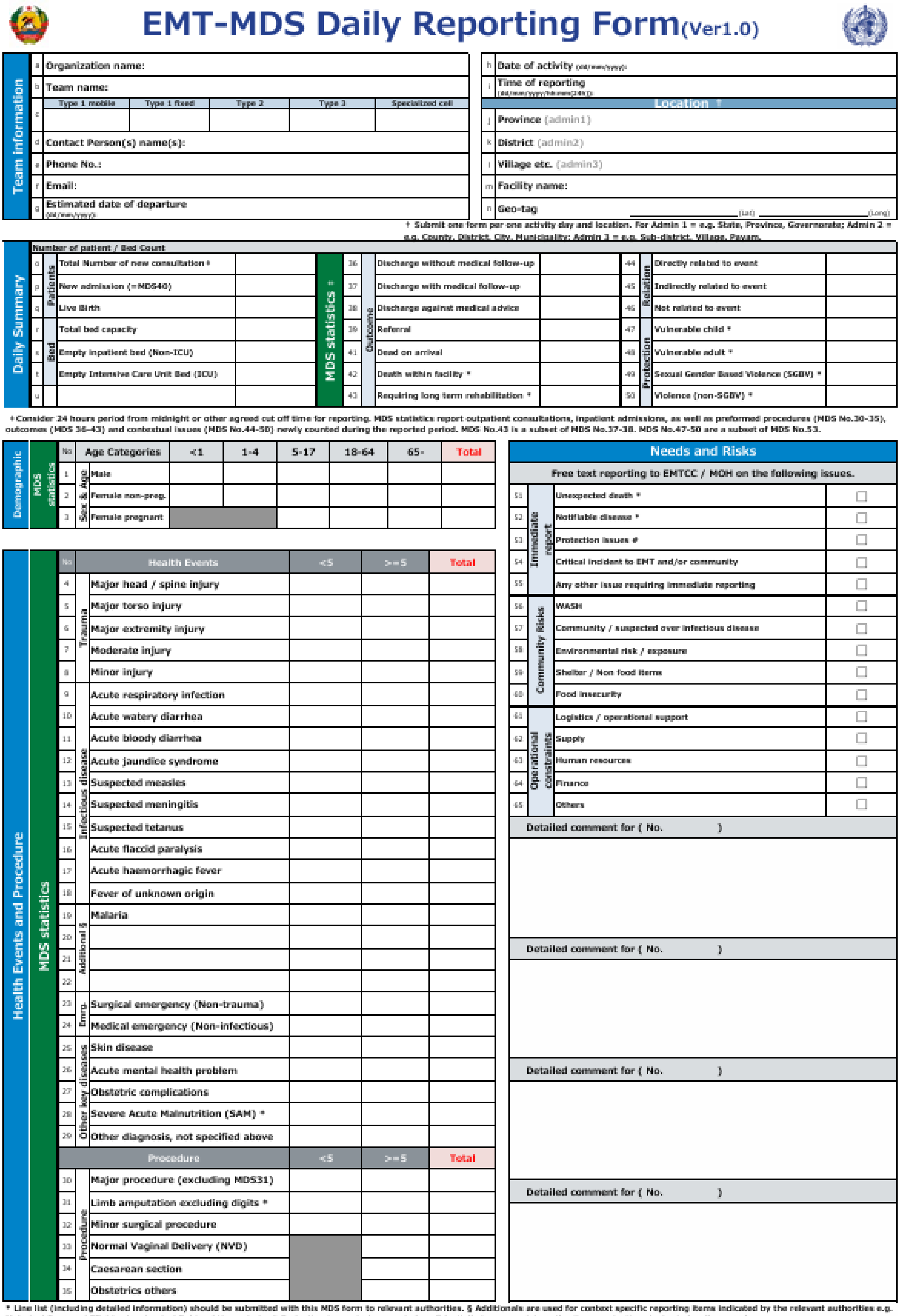


Figure 2: Pairwise comparisons of overall completeness according to emergency medical team (EMT) type and EMT classification. P value is derived from Dunn's test with Bonferroni correction and t-test to calculate the median and mean difference of data completeness among types of EMT and between non-classified and classified EMTs, respectively. N- Number of EMTs in each category.



EMT-MDS Daily Reporting Form(Ver1.0)

Team information

a	Organization name:				
b	Team name:				
c	Type 1 mobile	Type 1 fixed	Type 2	Type 3	Specialized cell
d	Contact Person(s) name(s):				
e	Phone No.:				
f	Email:				
g	Estimated date of departure (dd/mm/yyyy):				

h	Date of activity (dd/mm/yyyy):
i	Time of reporting (dd/mm/yyyy/hh:mm(24h)):
	Location †
j	Province (admin1)
k	District (admin2)
l	Village etc. (admin3)
m	Facility name:
n	Geo-tag ______(Lat) ______(Long)

† Submit one form per one activity day and location. For Admin 1 = e.g. State, Province, Governorate; Admin 2 = e.g. County, District, City, Municipality; Admin 3 = e.g. Sub-district, Village, Payam.

Daily Summary

Number of patient / Bed Count

o	Patients	Total Number of new consultation ‡	
p	Patients	New admission (=MDS40)	
q	Patients	Live Birth	
r	Bed	Total bed capacity	
s	Bed	Empty inpatient bed (Non-ICU)	
t	Bed	Empty Intensive Care Unit Bed (ICU)	
u			

MDS statistics ‡

No			
36	Outcome	Discharge without medical follow-up	
37	Outcome	Discharge with medical follow-up	
38	Outcome	Discharge against medical advice	
39	Outcome	Referral	
41	Outcome	Dead on arrival	
42	Outcome	Death within facility *	
43	Outcome	Requiring long term rehabilitation *	
44	Relation	Directly related to event	
45	Relation	Indirectly related to event	
46	Relation	Not related to event	
47	Protection	Vulnerable child *	
48	Protection	Vulnerable adult *	
49	Protection	Sexual Gender Based Violence (SGBV) *	
50	Protection	Violence (non-SGBV) *	

‡ Consider 24 hours period from midnight or other agreed cut off time for reporting. MDS statistics report outpatient consultations, inpatient admissions, as well as preformed procedures (MDS No.30-35), outcomes (MDS 36-43) and contextual issues (MDS No.44-50) newly counted during the reported period. MDS No.43 is a subset of MDS No.37-38. MDS No.47-50 are a subset of MDS No.53.

Demographic – MDS statistics

No		Age Categories	<1	1-4	5-17	18-64	65-	Total
1	Sex & Age	Male						
2	Sex & Age	Female non-preg.						
3	Sex & Age	Female pregnant						

Health Events and Procedure – MDS statistics

No		Health Events	<5	>=5	Total
4	Trauma	Major head / spine injury			
5	Trauma	Major torso injury			
6	Trauma	Major extremity injury			
7	Trauma	Moderate injury			
8	Trauma	Minor injury			
9	Infectious disease	Acute respiratory infection			
10	Infectious disease	Acute watery diarrhea			
11	Infectious disease	Acute bloody diarrhea			
12	Infectious disease	Acute jaundice syndrome			
13	Infectious disease	Suspected measles			
14	Infectious disease	Suspected meningitis			
15	Infectious disease	Suspected tetanus			
16	Infectious disease	Acute flaccid paralysis			
17	Infectious disease	Acute haemorrhagic fever			
18	Infectious disease	Fever of unknown origin			
19	Infectious disease	Malaria			
20	Additional §				
21	Additional §				
22	Additional §				
23	Emrg.	Surgical emergency (Non-trauma)			
24	Emrg.	Medical emergency (Non-infectious)			
25	Other key diseases	Skin disease			
26	Other key diseases	Acute mental health problem			
27	Other key diseases	Obstetric complications			
28	Other key diseases	Severe Acute Malnutrition (SAM) *			
29	Other key diseases	Other diagnosis, not specified above			

No		Procedure	<5	>=5	Total
30	Procedure	Major procedure (excluding MDS31)			
31	Procedure	Limb amputation excluding digits *			
32	Procedure	Minor surgical procedure			
33	Procedure	Normal Vaginal Delivery (NVD)			
34	Procedure	Caesarean section			
35	Procedure	Obstetrics others			

Needs and Risks

Free text reporting to EMTCC / MOH on the following issues.

No			
51	Immediate report	Unexpected death *	☐
52	Immediate report	Notifiable disease *	☐
53	Immediate report	Protection issues #	☐
54	Immediate report	Critical incident to EMT and/or community	☐
55	Immediate report	Any other issue requiring immediate reporting	☐
56	Community Risks	WASH	☐
57	Community Risks	Community / suspected over infectious disease	☐
58	Community Risks	Environmental risk / exposure	☐
59	Community Risks	Shelter / Non food items	☐
60	Community Risks	Food insecurity	☐
61	Operational constraints	Logistics / operational support	☐
62	Operational constraints	Supply	☐
63	Operational constraints	Human resources	☐
64	Operational constraints	Finance	☐
65	Operational constraints	Others	☐

Detailed comment for (No.)

Detailed comment for (No.)

Detailed comment for (No.)

Detailed comment for (No.)

* Line list (including detailed information) should be submitted with this MDS form to relevant authorities. § Additionals are used for context specific reporting items indicated by the relevant authorities e.g. Malaria / Dengue / TB / Leptospirosis / Rabies / Hazmat etc. # Protection issues to be reported confidentially to appropriate authority or protection cluster in locally agreed manner.

Supplementary Figure 1: Detailed information on emergency medical team (EMT) minimum data set (MDS) daily reporting items (available on: https://wkc.who.int/our-work/health-emergencies/knowledge-hub/health-data-management/health-data-collection-tools).