

CLINICAL PAPER

# Recommended guidelines for reporting on emergency medical dispatch when conducting research in emergency medicine: The Utstein style<sup>☆</sup>

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## KEYWORDS

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## Summary

**Objectives:** To establish a uniform framework describing the system and organisation of emergency medical response centres and the process of emergency medical dispatching (EMD) when reporting results from studies in emergency medicine and prehospital care.

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Emergency medical communication centres; EMS; Utstein; Reporting

*Design and results:* In September 2005 a task force of 22 experts from 12 countries met in Stavanger; Norway at the Utstein Abbey to review data and establish a common terminology for medical dispatch centres including core and optional data to be used for health monitoring, benchmarking and future research.

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## Introduction

The concept of providing emergency care for the seriously ill is one of the measures of a civilised society. Throughout the world, the emergency medical systems have been focused on the delivery of care to life-threatening emergencies. The provision of organised prioritisation and dispatching systems is the first step in the delivery of emergency medical support in the prehospital setting.

Emergency medical dispatching (EMD) as a part of the first link in the chain of survival contributes to the Utstein formula of survival, as outlined in Figure 1. This figure depicts the core concepts in improving survival and optimising outcome.<sup>1</sup>

In order to respond to a patient's emergency, or perceived emergency, the patient, or somebody on his/her behalf, needs to be able to make contact for help. This help is organised differently between countries, and access to different levels of care varies throughout the world.

Like other resources within the health care system, the capacity of emergency medical service (EMS) is not unlimited. There is thus a need for optimising the utilization of the EMS system. Fundamentally, the needs of the patient have to be evaluated and response decided. Two different responses can occur: (1) a medical response (life-threatening, emergency or non-emergency) is required to assist and support the patient or (2) no further medical action is required.

If action is required, the appropriate response should be identified and the best available local solution should be generated in order to meet the patient's need.

The European Emergency Data (EED) Project identified key stages in the patient pathway from the patient existing in society through to the delivery of complex care needs and is described as the patient journey in Figure 2.<sup>2</sup>

The responsibility of the emergency medical dispatch covers the four stages:

- (i) Access.
- (ii) Switchboard activity.
- (iii) Sorting and primary assessment.
- (iv) Response generation.

While EMS may take a wide range of different calls, the primary response needs to be unequivocally focused on the

critically ill or sickest patients. EMS must operate by delivering the appropriate and best evidence based care.

Substantial research work needs to be carried out in order to identify effective interventions and their method of delivery in an out of hospital setting, and to ensure that providers of such care are appropriately trained and skilled. It is crucial that EMD be included in this research. EMD is where the level of the first response is decided. There is also emerging knowledge that EMD should deliver advice and prearrival instructions to the caller for the immediate care of the victim. In the field of EMD, one of the first links in the chain of survival, there is a lack of standardisation, of definitions and also of randomised trials. Whilst rescuers have difficulties in recording specific intervals accurately during, for example a resuscitation event, the majority of dispatching centres are in a position to record accurate times and intervals for almost the whole process of creating an EMS response.

The aim of this paper is to establish a uniform framework describing the system and organisation of emergency medical communication centre (EMCC) and the process of EMD as a part of describing the EMS system when reporting results from studies in emergency medicine and prehospital care. There is a large diversity in how EMD is organised in different countries and also, in some cases, inside countries. The education and background of the dispatchers is very different. Without a uniform framework for describing and reporting the EMD process, it is extremely difficult to compare results and even more difficult to identify best practice.

## Description of the dispatch process in general terms

When an emergency incident occurs there is usually a delay until the incident has been recognised by the patient or bystanders. This delay is followed by the time it takes to alert the relevant medical services. This is generally achieved by a phone call to the EMCC. In prehospital research these times and intervals are inherently unclear<sup>3</sup> as they are usually difficult to record for the involved subjects and most often recollection and estimates are used as substitutes. It is also important to appreciate that it is the elapsed interval, not the actual time that is important. As soon as the call reaches the EMCC the process and times and intervals are generally monitored and recorded by the EMCC. From this point on, analysis of events and timelines can usually be measured with a high level of accuracy. Once the dispatcher has answered the call, there follows a process of identifying the need of the patient and assessing whether these are to be met by the services of a defined emergency medical system or other services. Next comes a process of triage

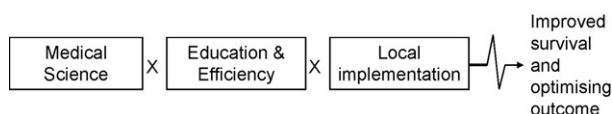


Figure 1 The Utstein formula of survival.

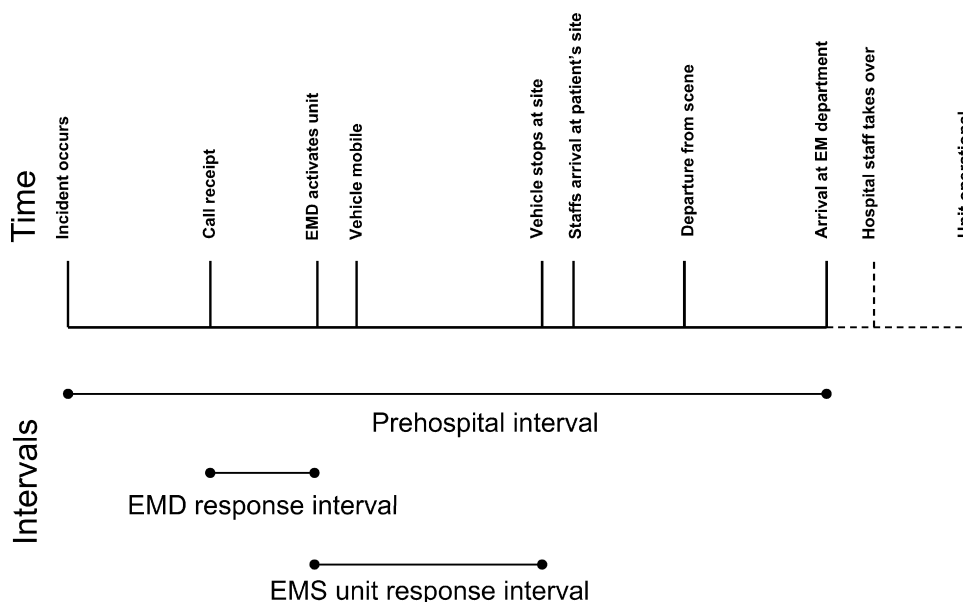


Figure 2 The patient’s journey.

where the specific medical need is identified followed by allocating a response in an appropriate time frame. Besides dispatching the allocated resources the EMD sometimes provides medical instructions and/or advice to the caller, e.g. instructions for cardiopulmonary resuscitation.<sup>4,5</sup>

In some systems (e.g. Norway, Sweden, UK) the call-taker is separated from the person dispatching the resources. The call-taker only connects the call further or he/she communicates with the patient/citizen and decides the level of response, while a separate dispatcher communicates with prehospital personnel and chose the resources and alerts the personnel.

Several attempts have been made to facilitate and standardise the process for the EMD by introducing decision support systems.<sup>6–10</sup> The response of the EMS is closely linked to the dispatching process. In reporting research involving prehospital emergency care it is evident that it is of outmost importance that the events that occur at the dispatch centre and appropriate times and intervals be clearly defined. This enables comparison of different EMD/EMS and is also essential for the evaluation of the performance of the emergency medical system.

## Recommendations

In September 2005 a task force of 22 experts from 12 countries met in Stavanger; Norway at the Utstein Abbey to review data and establish a common terminology for medical dispatch centres including core and optional data to be used for health monitoring, benchmarking and future research. In the following we present consensus definitions on what is identified as core data to be addressed in prehospital research when dispatching is a part of the response. It should be noted that research regarding the specifics in medical dispatching needs more detailed definitions and descriptions and should also focus on specified times and intervals that may not be necessary for routine reports. The recommen-

dations regarding specific EMD research will be presented in a separate article.

## Definitions and terms

### Description of the dispatching process in times and intervals

In comparing EMCCs, times and intervals are variables that are most likely to be valuable. For the comparison to be valid it is necessary to decide on triggers that are universal, i.e. which constitute generic parts of the process at the EMCC, regardless of how the centre and the surroundings services have been organised.

The process in a dispatch service can be summarised by the following sequential events:

The response interval of the public:	
1. The incident occurs	Core data
2. The emergency call is made	
The EMD response interval:	
3. The call is answered by the service	Core data
4. A need is identified	
5. A priority is decided	
6. A response is defined	
7. The response/resource is dispatched	Core data
8. Assistance may be given online if indicated and	
9. The call is terminated	

When reporting research in emergency medicine and particularly prehospital care, all these steps will be described briefly to give the reader a good overall view of the system.

### The response interval of the public

The interval starting when someone realises that the incident has occurred to the point when the emergency call is

made. This interval is difficult to measure because the times at which an incident occurs and is recognised are rarely recorded accurately.

#### **The incident occurs**

This time is difficult to recall precisely in the majority of cases and even less likely to have been recorded accurately. It is almost always an approximation. Nevertheless it is important to note this time as accurately as possible and to include it in the core data set.

There will be an automated emergency call and data transfer from new European cars (2009) in case of an emergency, called e-call (Pan-European in-vehicle emergency call).<sup>11</sup> Some implanted devices (defibrillators, pacemakers) are able to record incidents, so there may sometimes be an ancillary source of data.

In order to know that an emergency call must be made, somebody has to realise that an incident has occurred that may require an urgent response. This time is very difficult to determine accurately.

#### **The emergency call is made**

We define this point as the time when the incoming call is first registered (in the computerized system) at the centre answering emergency calls, regardless of when the call is answered. We realise that this is a proxy measure for the point of time when the call is made, because it depends on the speed of transmission in the network. If a call-taker in another centre has taken the call first and then reconnected it to the reporting centre, this should be mentioned. There is normally a difference in call set-up time between fixed and mobile networks. These differences are not, however, considered to be of a magnitude that are of medical significance.

#### **The EMD response interval**

This is the interval from when the incoming call is first registered to the time of the EMD response. This is usually to dispatch a unit, but it may also be: (1) to give medical advice, (2) to order other means of transport, (3) to dispatch a police/fire unit, (4) to activate the primary care health service or (4) not to take any action. The EMD response interval is a poor measure of quality if used in isolation, but taken together with other indicators such as giving the appropriate priority and dispatch of the correct resource, it does provide relevant information.

#### **The call is answered by the service**

How a dispatch system is organised may have a major influence on the EMCC access time. In many countries the caller must make the decision: "is this a medical emergency?", before the call is made. The caller then chooses to call the medical emergency number (113 in Norway, 144 in Austria, 155 Czech Republic, etc.) which is a direct line to medical dispatch. In yet another system, as in Finland, the dispatching of various services (fire, police, health) are handled at the same dispatch centre using the number 112. In the case of the services being combined in one centre, the time of EMCC answering the call is defined as that when the operator/call-taker lifts the receiver. We define the receipt

of the call as the time when a person authorised to carry out medical dispatch receives the call and is connected to the caller. This is also the time when the EMD initiates to identify the medical need, decide on a priority and defines a response. This is usually recorded accurately<sup>12</sup> and should be included in core data (Figure 2).

#### **The response/recourse is dispatched**

The time when the response is being dispatched is defined as when the EMCC operators initiate transmission of the message to the first resource. In most cases of medical emergencies, one or more emergency response resources are dispatched. This is generally done by transmission of a message, by phone or radio or as a data message. This is must be included with the core data as it is part of the EMD response interval.

After the EMCC has activated an EMS unit and that unit is on its way to the incident, the EMCC may still have an important role to play. The EMS unit may be re-directed to a higher priority incident, or the EMD may give advice to the caller regarding the immediate care of any who need help before the arrival of the EMS unit

### **Core data including times and intervals**

When describing research in which dispatch is a part of the system, some data should be considered as core. The time when the incidence occurs should be recorded as accurately as possible. For the dispatching process, it is important to record when the call is received and the interval until the EMS unit is activated by the EMD (dispatched) (Figure 2). The other times and intervals described above should be considered as supplementary.

It is of value to report how the data is recorded: (1) by automatic recording in a database, (2) by manual recording in a data based or (3) by paper based recording in dispatch forms and ambulance records. It should also be reported if clocks in the EMCC and the ambulances are synchronised.

When dispatch is involved in the process and required for research in prehospital care, it is essential to include a description of the population and community that is served by the EMCC, in accordance with the earlier recommendations by Cummins et al.<sup>13</sup> This is because the geographical and demographical situation may have substantial influence on response intervals and access to the EMS. This should be core data.

### **Discussion**

Effective responses to medical emergencies are crucial to for the emergency medical systems around the world. In order to be effective, an emergency service must be responsive and available, wherever and whenever a life-threatening emergency occurs. EMS requires the provision of EMD, not only to provide care for emergencies but also to be the gatekeeper and to participate in demand management by sorting and prioritisation of incoming calls. Research and quality assurance targeting the EMS often include the response interval, and in this the EMCC and the EMD both play a crucial role. We therefore suggest that some data from this process should be made widely available in order

to illustrate the quality of the prehospital process. The core data is simple and straightforward. It should include the estimate of the time when the incidence occurred, the time of the receipt of the call, and the time of the dispatch of the EMS unit, thereby defining the EMD response interval (Figure 2). The process of the dispatching service should be briefly described to give a view of the system.

The EMD has a key role in the initial response to medical emergencies occurring outside medical facilities. The dispatch process must be recognised as an essential part of the medical response, since it includes several steps for evaluating the incidence and the potential condition of the patient(s). By defining a uniform reporting system for both the EMCC and EMD, we believe that an important step will have been taken to high-lighten the importance of this part of the prehospital care of our patients. It will enable comparison of results for research and quality assurance processes within countries and internationally.

The dispatch process is complex; it has not been our intention in the current paper to enter into fine detail. A closer analysis will be required for the purposes of research in the EMCC specifically around the dispatch process. This will be the subject for another paper.

### Conflict of interest statement

None.

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