A casemix classification for ambulance services

Even in countries with a long history using casemix, ambulance services tend to be block-funded. With the rising demand and costs of ambulance services, there is a need to develop approaches that capture the complexity of patients using ambulance services and reflect this in funding. This paper will report on the initial phase of this work: an analysis of cost drivers of ambulance services to develop a casemix classification.

Data from an ambulance service for a state within Australia were obtained from the service's computer-aided dispatch system, electronic medical records, patient health care records and aeromedical service were provided for 4 years (2017–18 to 2020–21), for a longitudinal view of ambulance activity and to smooth fluctuations due to COVID-19.

Process mapping and workshops were undertaken first, to understand the services. Through this, 5 product streams were defined:

1. Emergency episodes, road ambulance
2. Other episodes, road ambulance
3. Aeromedical
4. Events
5. Other services

An episode of care was defined as the unit of count for streams 1 and 2, combining all activity relating to an incident (e.g. multiple ambulances arriving at the scene) into an episode to reflect the resource intensity of incidents using multiple resources. Although it was considered desirable to integrate air ambulances and road ambulances relating to a specific incident, data systems currently do not do this routinely. Therefore, aeromedical was defined as a separate stream with separate products. The unit of count was defined as a "flight", reflecting that more than one patient can be retrieved by a single flight. This will be revisited when road ambulance and aeromedical data are integrated in the near future.

Following the above, for stream 1, the quantitative data were used to develop classes based on resource use while maintaining clinical and business relevance. The products identified for stream 1 were:

1. Call only
2. Dispatch but no treatment
3. Dispatch and treat
4. Dispatch, treat, retrieve

The variables explored for creating classes were:

1. Dispatch priority level assigned in the call taking process.
2. Nature of the problem identified by the call taker.
3. Clinical protocol/s implemented by the on-scene clinicians.

Markers of resource use analysed were:

1. Episode duration.
2. The mean number of vehicles used per episode.
3. The mean number of intensive care paramedics.

Due to the infrequency of episodes where other specialised skillsets are required (e.g. special casualty access), these were not analysed at this stage.

Dispatch priority levels showed difference in resource use amongst episodes, while the nature of problem and clinical protocol did not. Therefore, for stream 1, classes based on priority levels were created for products 3 (Dispatch and treat) and 4 (Dispatch, treat, retrieve).

This project will be followed by a costing study to finalise the classification.

The expansion of casemix to non-traditional areas such as ambulance services is recognition of the benefits that casemix can have for matching funding to complexity and encouraging innovations to manage demand and costs.