Prehospital early warning scores for adults with suspected sepsis: the PHEWS observational cohort and decision-analytic modelling study

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Plain language summary

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Plain language summary

Sepsis is a life-threatening condition in which an abnormal response to infection causes heart, lung or kidney failure. People with sepsis need urgent treatment. They need to be prioritised at the emergency department rather than waiting in the queue. Paramedics attempt to identify people with possible sepsis using an early warning score (based on simple measurements, such as blood pressure and heart rate) alongside their impression of the patient's diagnosis. They can then alert the hospital to assess the patient quickly. However, an inaccurate early warning score might miss cases of sepsis or unnecessarily prioritise people without sepsis. We aimed to measure how accurately early warning scores identified people with sepsis when used alongside paramedic diagnostic impression.

We collected data from 71,204 people that two ambulance services transported to four different hospitals in 2019. We recorded paramedic diagnostic impressions and calculated early warning scores for each patient. At one hospital, we linked ambulance records to hospital records and identified who had sepsis. We then calculated the accuracy of using the scores alongside diagnostic impression to diagnose sepsis. Finally, we used modelling to predict how many patients (with and without sepsis) paramedics would prioritise using different strategies based on early warning scores and diagnostic impression.

We found that none of the currently available early warning scores were ideal. When they were applied to all patients, they prioritised too many people. When they were only applied to patients whom the paramedics thought had infection, they missed many cases of sepsis. The NEWS2, score, which ambulance services already use, was as good as or better than all the other scores we studied. We found that using the NEWS2, score in people with a paramedic impression of infection could achieve a reasonable balance between prioritising too many patients and avoiding missing patients with sepsis.

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