Aim The chance of surviving Out-of-Hospital Cardiac Arrest (OHCA) is highly correlated with medical dispatchers’ recognition of the condition during emergency calls.\(^1,2\) We investigated if machine learning (ML) could surpass medical dispatchers by applying ML directly on the realtime dialogue between the caller and the dispatcher.

Method We retrieved all 1,616,500 emergency calls recorded for 2014 to the Emergency Medical Dispatch Centre Copenhagen (EMDC). From the Danish Cardiac Arrest Register (DCAR) and audit of call recordings where resuscitative efforts were begun, we extracted information on all OHCA in 2014. Emergency medical services (EMS) witnessed cardiac arrests and damaged audiofiles/recordings were excluded. The data-set for analysis contained henceforth 1,583,300 non-OHCA calls and 2,157 OHCA calls. Each OHCA could span several calls from multiple callers. Time-to-recognitation by the ML-Model was calculated for each call and for the dispatchers found by auditing all OHCA calls.

Results The ML-Model reached a sensitivity of 93.1% (95% CI: 91.9 to 94.1) and a specificity of 98.0% (95% CI: 97.9 to 98.1) on OHCA-calls. Sensitivity of the dispatchers was 72.9% (95% CI: 70.0 to 75.6). Specificity is unknown for dispatchers, as false positives are not registered. Time-to-recognitation was significantly shorter for the ML-model (mean time-to-recognition 00:48 mm:ss, 95% CI: 00:46 to 00:50) compared to dispatchers (mean time-to-recognition 01:19 mm:ss, 95% CI: 01:13 to 01:25) (p<0.0001).

Conclusion In recordings of 1,616,500 calls to EMDC a ML-model could recognise a higher proportion of OHCA, compared to medical dispatchers. Furthermore, we found that the ML-model was significantly faster in recognising OHCA.

REFERENCES