compare their characteristics and diagnoses with one-time users. Additional knowledge about repeated users may help identify appropriate alternative interventions.

Methods Population-based cohort study on patients to whom an emergency ambulance was dispatched after an emergency call in the North Denmark Region (5 80 000 inhabitants), 2012–2013. Each patient was included at first ambulance dispatch and followed one year. One-time users (one ambulance dispatched) were compared to repeated users divided into: moderate (2–4), frequent (5–9), and super users (≥ 10). Hospital diagnoses according to ICD-10 were retrieved.

Results We identified 36 210 patients corresponding to 46 203 emergency ambulances dispatched within the one-year follow-up. The results below are presented according to the four groups: one-time, moderate, frequent, and super users. Percentage of patients (ambulances): 83.2% (65.2%), 15.8% (28.9%), 0.9% (4.2%), 0.1% (1.7%). Male gender: 53%, 56%, 59%, 62%. Median age (interquartile range): 55 (29–72), 61 (41–77), 55 (40–71), 52 (37–68). Charlson comorbidity index ≥ 3 : 3%, 12%, 16%, 13%. Percentage diagnosed with mental disorders (ICD-10 chapter 5; $n=2,149$): 4%, 6%, 12%, 19%. Respiratory diseases (ICD-10 chapter 10; $n=3,033$): 5%, 9%, 14%, 25%. Injuries, poisoning, and external causes (ICD-10 chapter 19, $n=11,709$): 33%, 20%, 15%, 9%.

Conclusion Repeated EMS users constituted 16.8% of patients (34.8% of ambulances). Compared to one-time users, repeated users were more often male, had higher comorbidity, were more often diagnosed with mental and respiratory illnesses, and less often with injuries, poisoning, and external causes.

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35 MANUAL VERSUS SEMI-AUTOMATIC RHYTHM ANALYSIS AND DEFIBRILLATION FOR OUT-OF-HOSPITAL CARDIAC ARREST

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Aim Although manual and semi-automatic external defibrillation (SAED) are commonly used in the management of cardiac arrest, the optimal strategy is not known. We hypothesised that SAED would reduce the time to first shock and increase survival compared to a manual strategy.

Methods Between 2005 and 2015, we included adult out-of-hospital cardiac arrests (OHCA) of presumed cardiac aetiology. On October 2012, a treatment protocol utilising SAED was introduced following years of manual defibrillation by paramedics. The effect of SAED implementation on patient outcomes was assessed using adjusted interrupted time series models.

Results Of the 14 776 cases, 10 224 (69.2%) and 4552 (30.8%) occurred during the manual and SAED protocols, respectively. After adjustment for arrest confounders and temporal trend, the odds of delivering the first shock within 2 min of arrival increased under the SAED protocol (adjusted odds ratio [AOR] 1.72, 95% CI: 1.32, 2.26; $p<0.001$). Despite this, the SAED protocol was associated with a reduction in return of spontaneous circulation (AOR 0.81, 95% CI: 0.68, 0.96; $p=0.01$), event survival (AOR 0.74, 95% CI: 0.62, 0.88; $p=0.001$) and survival to hospital discharge (AOR 0.71, 95% CI: 0.55, 0.92; $p=0.009$) when compared with the manual protocol. Although SAED reduced the time to first shock, there was no improvement in the rate of successful first shock cardioversion (AOR 0.73, 95% CI: 0.51, 1.06; $p=0.10$).

Conclusion Although SAED improved the time to first shock, this did not translate into higher rates of successful cardioversion or survival for OHCA patients. Advanced life support providers should be trained in a manual defibrillation protocol.

Conflict of interest None declared.

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36 NOT TRANSPORTING ALL PAEDIATRIC OUT-OF-HOSPITAL SETTING PATIENTS BY AMBULANCE SEEMS TO BE SAFE

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Aim We examined the safety of not transporting all paediatric out-of-hospital (OOH) emergency patients to emergency department by ambulance.

Methods We report observations from a dataset covering all ($n=2387$) emergency medical services (EMS) responses for paediatric patients (age 0 to 15 years) in 2015 in Helsinki, Finland (population 628 208, paediatric population 93 054 during 2015). Time intervals, patient characteristics, vital measurements, diagnoses, medical treatments, procedures and outcomes were analysed.

Results The incidence of EMS-treated paediatric OOH emergencies was 3.8 per 1 000 inhabitants and 25.7 per 1 000 in 0–15 year-old inhabitants. There were 1 069 (44.8%) non-transported paediatric patients. In 926 (86.6%) cases decision of not transporting a patient was made without consulting a doctor. 176 (16.5%) of non-transported patients got to a tertiary university hospital emergency department within 3 days by other means, comprising 184 visits. 115 (62.5%) of the visits were encouraged by emergency medical personnel. Only 3 patients' appearance was other than good at presentation. 90 (8.4%) of the patients were medicated at the emergency department. 21 (2.0%) of the patients were given respiratory support (including any form of inhalations). 28 (2.6%) had to be admitted to the hospital; 11 (1.0%) of them for more than 2 nights. None of the non-transported patients were admitted to the intensive care unit within 3 days following the call or died during the 1 year follow-up period.

Conclusion Transporting selectively those paediatric patients by ambulance, who need transportation the most, appears to be safe in the light of this dataset.

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37 EMERGENCY MEDICAL DISPATCHERS' PERCEPTION OF BARRIERS IN HANDLING EMERGENCY CALLS. A QUALITATIVE STUDY

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Aim Medical dispatching is a highly complex procedure and has an impact upon patient outcome. It includes handling emergency calls, prioritisation of resources and the provision of guidance and instructions to callers. Whilst emergency medical dispatchers play a key role in the process, their perception of the process is rarely reported. We explored emergency medical dispatchers' perception of their role in emergency call handling and their perception of barriers.

Methods An explorative qualitative interview study was designed. Modified grounded theory was used for the data analysis.

Results A total of 5 paramedics and 6 registered nurses were interviewed. A model of the emergency call handling process was drawn based on the data. The analysis of barriers resulted in themes relating to the callers and the medical dispatchers, from whom four and three respective themes were identified. For callers, the motive for calling, the situation, the perception and presentation of the problem was influencing factors. For the dispatchers the expertise, teamwork and organisation influenced the process.

Conclusion The results indicate factors influencing the medical dispatch process, as perceived by medical dispatchers. Callers lack knowledge about best utilisation of the emergency number and the medical dispatching process, which can be improved by public awareness campaigns and incorporation of knowledge in first aid courses. For medical dispatchers the most potent modifiable factors were based upon the continuous professional development of the medical dispatchers and the system that supports them.

Conflict of interest None declared.

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38 A 5 YEAR COMPARISON OF PUBLIC RECOGNITION AND WILLINGNESS TO PERFORM BYSTANDER CPR IN A METROPOLITAN CITY

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Aim Bystander cardiopulmonary resuscitation (CPR) plays an important role in improving survival rate of sudden cardiac arrest patients. Various measures can be implemented to

achieve better outcome in bystander CPR. We aimed to compare CPR willingness, public CPR recognition, and CPR education between a 5 year interval. Nationwide and regional public interventions involving public education, research, and automated defibrillator (AED) installation were made during the period.

Methods Two surveys separated with a 5 year gap were done using structured questionnaires, targeting a total of 2141 citizens in a single metropolitan city. Respondents' general demographic characteristics, CPR knowledge and willingness, and status of CPR education were questioned.

Results After the interventions, the rate of respondents willing to perform CPR (73.8 vs 76.0%, $p=0.269$) and recognising CPR (89.6% vs 90.8%, $p=0.343$) were increased, but not with statistical significance. More respondents were aware of AEDs (26.1% vs 84.4%, $p<0.001$) and specific knowledge in performing CPR (1.6% vs 11.8%, $p<0.001$), possibly leading to more confidence in performing CPR (33.9% vs 45.4%, $p<0.001$). Regarding CPR education, the portion of respondents with education experience (36.5% vs 56.6%, $p<0.001$) and willing to seek future CPR education (75.8% vs 86.6%, $p<0.001$) were higher.

Conclusion Various interventions to promote bystander CPR were associated with confidence in performing bystander CPR, AED recognition and CPR education. However, bystander CPR willingness and public CPR recognition were not significantly altered.

Conflict of interest None declared.

Funding None declared.

39 HELIPORT PROXIMITY IS CRUCIAL IN REDUCING TREATMENT DELAY IN PATIENTS WITH ST-ELEVATION MYOCARDIAL INFARCTION TRANSPORTED BY HELICOPTER – HELIPROXY STUDY

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Aim Since 2014, HEMS (Helicopter Emergency Medical System) has been an integrated part of the emergency medical system, providing fast and high-competence helicopter transport of patients to highly specialised care. Different heliport solutions at the receiving hospitals may have an impact on the time delay from landing to treatment (LTT). In this study, we compared the time delay from landing to arrival at the catheterization laboratory in patients with ST Elevation Myocardial Infarction (STEMI) accepted for primary Percutaneous Coronary Intervention (pPCI) at one of the four centres in Denmark. We hypothesised that heliport proximity strongly influence the LTT.

Methods We prospectively recorded the time from the landing at the heliport to arrival at the catheterization laboratory from October 1st 2014 to December 31st 2016 in all STEMI patients transported by HEMS Denmark. LTT was compared between two centres with heliports at the hospital, and two centres with heliport located outside the hospital, necessitating ground transportation in ambulance.

Results 1163 patients were included in the study. 310 were excluded due to missing data. The two hospitals with hospital based heliports showed shorter LTT compared to the two