

# Out-of-hospital management and outcome of ST-elevation acute coronary syndromes in Swiss Canton Ticino: 10 years of the preH-ACS registry

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## Introduction

Acute coronary syndrome (ACS) with ST elevation (STE) is one of the most frequent causes of emergency medical services (EMS) activation. Moreover, about 10% of ACS are complicated by out-of-hospital cardiac arrest (OHCA).

Pre-hospital management of these patients have to be provided by a fast and well-organized network in order to improve chance of survival with a good outcome.

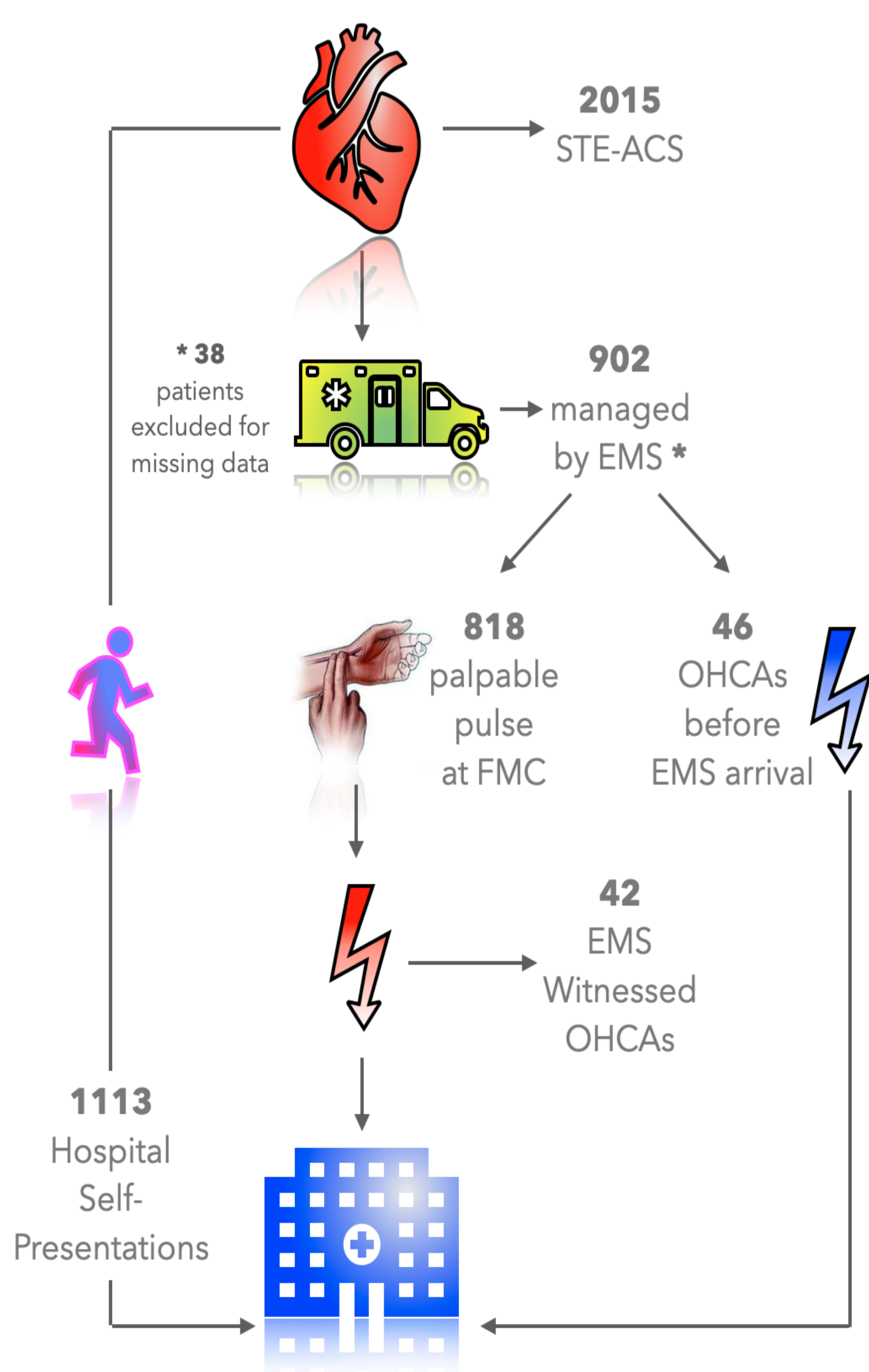
## Methods

We performed a retrospective analysis of prospectively collected data of STE-ACS Registry since 1st of January 2010 to 31st of December 2020 in Swiss Canton Ticino.

Since 2010, the preH-ACS registry enrolled all patients with a confirmed Hospital diagnosis of STE-ACS.

All data including hemodynamics, arrhythmias occurrence, pre-hospital clinical management and timing of intervention were collected.

## 2010-2020 occurrence of STE-ACS in Swiss Canton Ticino



## Purpose

Aim of this study was to evaluate STE-ACS incidence, management and outcome in Swiss Canton Ticino and to assess prevalence and clinical characteristics of patients presenting with an OHCA during STE-ACS. Finally we investigated clinical predictors which may help to identify patients with a higher risk of OHCA during STE-ACS.

## Results

A total of 2015 STE-ACS occurred in Canton Ticino (male gender 72%). Of them, 902 were fully managed in the out-of-hospital setting (45%) and 1113 (55%) self-presented at the Hospital Emergency Room. Prevalence on the territory significantly varied, with a higher proportion of events in the biggest urban agglomerates. Yearly incidence ranged from 51 per 100'000 inhabitants/year in 2010, to 42 per 100'000 inhabitants/year in 2020. Times of intervention were largely within those recommended in International Guidelines (see figure below).

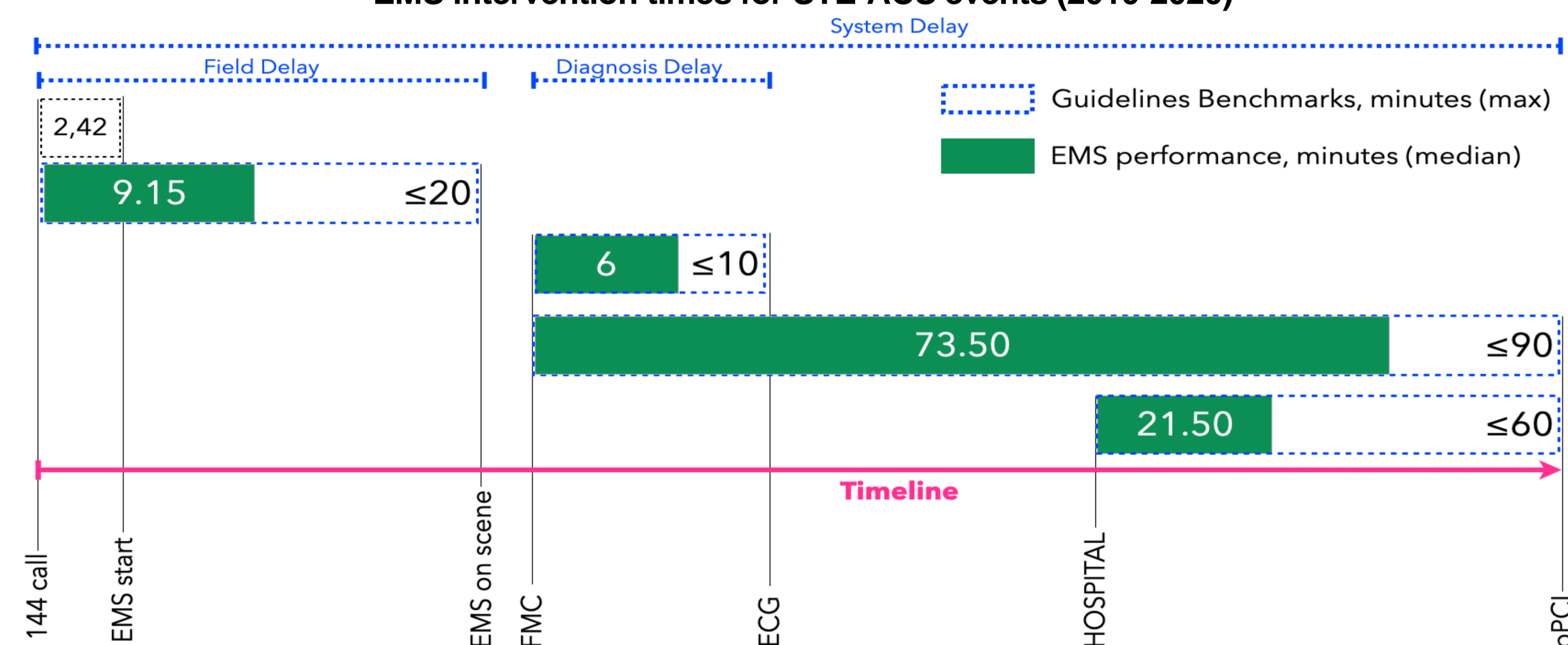
A total of 88 patients (10%) had an OHCA during STE-ACS, 46 (52%) before EMS arrival and 42 (48%) after first medical contact (FMC). Yearly proportion of OHCA ranged from 4% to 15% over years without a statistically significant trend. Overall, 67% of patients who suffered from an OHCA during STE-ACS showed a shockable first rhythm. This proportion raised to 90% in the EMS witnessed group. Clinical characteristics and outcome in OHCA group respect to STE-ACS were reported in the table. Patients who had an OHCA were significantly younger and more often males.

OHCA patients were more often transported to the hospital with a combination of ambulance and helicopter, as compared with STE-ACS patients without OHCA (26% versus 13%, p 0.03). Median time of ambulance arrival did not significantly differ between the two groups as well as the median time to reperfusion.

Mortality was 4 times-higher in OHCA patients (17% versus 4%, p 0.002).

At multivariable regression analysis, a low systolic blood pressure (<90 mmHg) and the younger age were associated with a higher probability to have an OHCA.

## EMS intervention times for STE-ACS events (2010-2020)



## Patients characteristics according to clinical presentation

		STE-ACS	OHCA during STE-ACS	P value
EMS management	Primary, n (%)	674 (86.9)	31 (73.8)	0.003
	Combined, n (%)	102 (13.1)	11 (26.2)	
Age	mean (± SD)	67 (± 13)	63 (± 13)	0.003
Male gender	N, (%)	550 (70.9)	35 (83.3)	0.10
Time from 144 call to EMS arrival, min	median [IQR]	9.58 [7;14]	8.55 [6;12]	0.07
Time from FMC to pPCI, min	median [IQR]	73 [62;89]	84 [68;109]	0.07
Referred Pain at FMC	mild, n (%)	156 (22.8)	6 (19.4)	0.90
	moderate, n (%)	260 (38)	12 (38.7)	
	severe, n (%)	268 (39.2)	13 (41.9)	
Delta Pain (FMC to Hosp. admission)	median [IQR]	-3 [-5;-1]	-5 [-7;-3]	0.002
Survival at Hospital Discharge	dead, n (%)	26 (4.4)	7 (17.1)	0.002
	alive, n (%)	561 (95.6)	348 (82.9)	

## Conclusions

Yearly incidence of ST elevation Acute Coronary syndromes in Swiss Canton Ticino was almost stable over years, with a territorial prevalence of events largely related to urban areas distribution. In line with international data, in our region out-of-hospital cardiac arrest complicates up to 15% of STE-acute coronary syndromes. A high percentage of hospital self-presented patients with STE-ACS (55%) was observed. This observation requires further interventions to raise awareness about importance of early activation of the EMS network in case of chest pain.