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Sudden cardiac death: good perspectives with this major health care issue

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In Europe, it is estimated that 350,000 people are dying each year following sudden cardiac death with unsuccessful out-of-hospital cardiopulmonary resuscitation (OOH-CPR) [1]. This is almost 1,000 patients every day over the whole year. The same happens in the USA and in other industrialized areas of our world. Thus, sudden cardiac death is one of the leading causes of death in industrialized nations [1]. It is most probably the “killer number three” following cancer and other cardiovascular causes [2]. It is good to see that more and more studies and activities are being initiated to further elucidate and

combat this problem [3]. One thousand deaths per day—this is as if two jumbo jets would crash every day during the whole year, without any survivors. If this would happen, would not we invest billions of euros, not only to search for victims and causes, but also to put an immediate stop to it?

Europe is not uniform. We know that we can find differences between nations, areas, and emergency medical service (EMS) systems. The overall incidences of sudden cardiac death with OOH-CPR are reported to be between 30 and 120 per 100,000 inhabitants and year. The incidences of started CPR are lower: between 20 and 75 per 100,000 inhabitants and year (Table 1).

The overall survival rates are between 3 % and more than 20 % [4]. Bougouin and colleagues [5] now report the numbers and outcomes of the Greater Paris area over 2 years. The incidence of OOH-CPR (29 per 100,000 inhabitants and year) is rather low in their report, which may reflect low rates of start of CPR. In parallel, the bystander CPR before EMS arrival rate is rather high (45 %) and not so far away from the respective rates reported from the Netherlands and Scandinavian countries, where huge efforts have been undertaken in recent decades to improve survival following OOH cardiac arrest (OOH-CA) [6]. All this is very successful: for example, in Denmark, a threefold improvement in survival following OOH-CA was noted over the 10 years of a recent study [7]. Taking into consideration the low incidence of OOH-CPR in the present study and the high bystander CPR rate accompanied by a mean EMS response time of 9.3 min, the overall survival rate of 7.5 % seems relatively low. This is one picture.

Another picture is that we get more and more information about incidences and survival following OOH-CA in Europe and elsewhere [8]. This is excellent. And we get more and more comparative studies, comparing different nations, regions, systems etc. [9]. All this helps us to further improve care around “killer number three”. The

Table 1 Data from the first EuReCa paper [3]

	Andalusia	Belgium	Germany	North Holland 2008	Sweden
Total population in the reported region	5,575,128	10,600,000	5,622,667	2,400,000	9,000,000
OHCA considered for resuscitation	1,102	5,671	2,267	1,433	
Incidence of OHCA considered for resuscitation/100,000	19.77	53.50	40.32	59.71	
Resuscitation started	1,031	5,671	2,202	1,114	3,535
Incidence of started resuscitation/100,000	18.49	53.50	39.16	46.42	39.28

next step on the way to a better understanding is the European Resuscitation Council (ERC)—supported by the European Society of Intensive Care Medicine (ESICM), the European Society of Cardiology (ESC), the European Society of Anaesthesiology (ESA), and the European Society of Emergency Medicine (EuSEM)—initiative to combine and analyze data from existing European resuscitation registries [3]. The European Registry of Cardiac arrest (EuReCa) will come up with a 1-month survey of 20 national registries in October 2014. This study is called EuReCa-ONE and will show differences and opportunities for providing the best CPR for victims all over Europe (<http://www.eureca-one.eu>).

Milestones in improving survival following OOH-CA are bystander CPR, telephone CPR by dispatcher, fast EMS response, hypothermia and temperature management, coronary revascularization, standard operating procedures, and the system approach. It takes a system to save lives [10–13]. We can see all this in Paris and elsewhere. And we can further improve.

The system starts at the layperson's level: OOH-CA is witnessed in 60–80 % of cases, and the brain just needs 3–5 min of downtime to start to die. This is much faster than the EMS can arrive in almost all cases. Thus, the big picture and chance to further improve is the wife, the friend, the taxi driver, schoolchildren, and others.

Think big. We have seen this in Denmark and elsewhere, a blueprint for Europe and the world [7]: Schoolchildren's education is the way to go. A threefold improvement in survival cannot be achieved with any improvements in professional medical care.

This needs political engagement and political support. On 16 October 2013, 16-year-old Kea, who successfully resuscitated 12-year-old Nic some months ago—when waiting more than 10 min for the EMS—together instructed the European Commissioner of Health, Tonio Borg, how to successfully resuscitate. On 16 October 2013, we had the European Restart a Heart Day, and the motto was “Schoolchildren save lives.”

The ERC, in an interdisciplinary and inter-professional campaign together with many other European organizations, suggests a European-wide educational program for

schoolchildren CPR training. We know from several studies that we can start at the age of 12 years and earlier, that we need 2 h per year (we can take one out of biology and one out of sports), that teachers can do it following professional advice and education, and we all can and hopefully will help here. If the schoolchildren—like in Denmark and elsewhere [11]—do it every year, they will teach this to their family at home, and they will never forget. We will not only see the number of survivors of OOH-CA increasing, we will also see social side effects. All who have ever seen schoolchildren learning CPR have seen the most enthusiastic and positive young people. They do not learn how to compete here, they learn to help each other. And a young boy from a social hot spot in Belgium—who initially did not want to participate in CPR training—said at the end of his training: “this was the first time for a long time that I was touching someone else without beating him immediately.”

We also need to have more focus on the dispatching: if the dispatcher identifies cardiac arrest, the survival rate is much higher than if not; rapid dispatching saves lives [14]. Telephone CPR is a must. Details of this important link in the chain of survival were missing from the Greater Paris study. We hope that the SDEC registry will improve on this topic.

European-wide schoolchildren CPR training; telephone CPR by dispatcher; European-wide cardiac arrest registries; and legislation that not only requires the registration of each death by traffic accident, but it must also become a must to register OOH-CA. We can easily save 100,000 additional lives every year in Europe, 274 every day, and one every 5 min.

We are now living in an era of change. It is no longer the traffic accidents in most developed countries, after we have invested billions of euros over the recent decades to improve here; now it is sudden cardiac death. We must invest here now.

On 16 October 2014, we will have the second European Restart a Heart Day, and the motto in 2014 is “Saving loved ones.” Everyone, every specialty, every profession, every system, every institution—and every school—are cordially invited to join in (www.erc.edu).

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