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Review

A narrative review of European public awareness initiatives for cardiac arrest



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Abstract

A high resuscitation rate can lead to better overall survival after cardiac arrest. In Europe, various campaigns in the field of lay resuscitation are achieving up to a threefold increase in survival. As part of the new Systems Saving Lives (SSL) chapter, the European Resuscitation Council (ERC) guidelines recommend cardiac awareness campaigns to engage the broader community. It has been noted that countries with high survival rates after an out-of-hospital cardiac arrest (OHCA) start education in resuscitation techniques at school age. The ERC 2021 guidelines recommend that all schoolchildren should routinely receive CPR training each year. Since 2015, the KIDS SAVE LIVES statement recommended for two hours of instruction per year in all schools worldwide by age of 12. Cardiac awareness campaigns like World Restart a Heart Day (WRAH) are aimed to raise awareness about resuscitation and to train as many people as possible.

Keywords: Lay resuscitation, KIDS SAVE LIVES, Bystander CPR, Cardiac awareness campaigns, World Restart a Heart, Cardiac arrest

Introduction

Out-of-hospital cardiac arrest (OHCA) is the third leading cause of death in industrialised countries.¹ The annual incidence of OHCA in Europe ranges from 67 to 170 per 100,000 inhabitants.² If the brain remains without oxygen supply, vital structures are irreparably destroyed after only 3–5 minutes.³ But even in countries with the best emergency call systems, it usually takes more time for the ambulance to reach the affected person.⁴ Up to 100,000 additional lives could be saved each year in Europe if bystanders who observe a cardiac arrest were to bridge the time until professional help arrives by taking immediate resuscitation measures.

Resuscitation rates by laypersons vary widely within European countries. While rates of 70–80% can be achieved in Scandinavian countries, other countries are well below this rate.⁵ Early chest compression is associated with increased survival.⁶ Consequently, increasing the lay resuscitation rate to such a high level is expected to result in a threefold increase in survival.⁷ Return of spontaneous circulation (ROSC) is higher for cardiopulmonary resuscitation (CPR) by bystander at 32.3% compared to no bystander CPR at

28.2%, as is overall survival at 9.1% compared to 4.3%.⁵ A nationwide study examined trends in survival after cardiac arrest in Sweden over 30 years and found an increase in the lay resuscitation rate, which rose from 30.9% to 82.2% between 1990 and 2020, as well as an increase in survival after OHCA.⁸ Therefore, the education of lay people and especially schoolchildren in resuscitation techniques is a key component in saving lives in the event of cardiac arrest. Raising awareness campaigns about cardiac arrest in Europe represent a pioneer in increasing lay resuscitation rates. Other countries, such as Brazil “KIDS SAVE LIVES Brazil”, are adapting these initiatives to train school children nationwide in basic life support.⁹

History of cardiac arrest awareness campaigns

In 2012, the European Parliament adopted a written declaration calling for comprehensive resuscitation and automated external defibrillator (AED) use training programs in all member states. The written declaration requested for adaptation of legislation in EU member states to ensure national strategies for equitable access to high-quality resusci-

Abbreviations: ERC, European Resuscitation Council, OHCA, out-of-hospital cardiac arrest, SSL, Systems Saving Lives, WRAH, World Restart a Heart, ROSC, Return of spontaneous circulation, ILCOR, International Liaison Committee on Resuscitation, CAC, Cardiac Arrest Center, IHCA, in-hospital cardiac arrest

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tation and defibrillation. The statement also required the establishment of a *European cardiac arrest awareness week*. As part of the strategy to increase lay resuscitation rates, the European Resuscitation Council (ERC) announced plans to introduce an annual *European Restart a Heart Day* on October 16.¹⁰ Therefore, the ERC guidelines call for national governments and resuscitation councils to collaborate on action days, raise awareness of the importance of lay resuscitation and AED, train as many citizens as possible, and develop further innovative strategies to save more lives.¹¹

Since 2015, the World Health Organization (WHO) endorsed a joint statement from the ERC, the European Patient Safety Foundation, the International Liaison Committee on Resuscitation

(ILCOR), and the World Federation of Anesthesiologists to introduce schoolchildren's education in resuscitation. The curriculum recommended in the KIDS SAVE LIVES statement two hours of instruction per year in all schools worldwide by age 12.¹²

The ERC updated the resuscitation guidelines in 2021 based on the consensus of the ILCOR.¹³ In this context, particular relevance was attached to the new chapter on *Systems Saving Lives* (SSL). Topics covered in this chapter include the chain of survival, measuring resuscitation performance, smartphone apps to engage the public, Cardiac Arrest Center (CAC) and the role of a dispatcher, as well as cardiac arrest awareness campaigns and training activities like *World Restart a Heart* (WRAH) or KIDS SAVE LIVES (Fig. 1).

SYSTEMS SAVING LIVES GL 2021

5 TOP MESSAGES

1. RAISE AWARENESS ABOUT CPR AND DEFIBRILLATION

- Train as many citizens as possible
- Engage with World Restart a Heart Day
- Develop new and innovative systems and policies that will save more lives

2. USE TECHNOLOGY TO ENGAGE COMMUNITIES

- Implement technologies to alert first responders to cardiac arrests through smartphone apps / text messages
- Develop communities of first responders to help save lives
- Map and share the locations of public access defibrillators

3. KIDS SAVE LIVES

- Teach all school children to do CPR using “check, call and compress”
- Get children to teach their parents and relatives how to do CPR

4. CARDIAC ARREST CENTRES

- Where possible care for adult patients with OHCA in cardiac arrest centres

5. DISPATCH ASSISTANCE DURING CPR

- Provide telephone assisted CPR for people who are unresponsive with absent or abnormal breathing
- Work with dispatch staff to continually monitor and improve telephone assisted CPR

Fig. 1 – Systems Saving Lives Guidelines 2021–5 Top Messages European Resuscitation Council Guidelines 2021: Systems Saving Lives: <https://doi.org/10.1016/j.resuscitation.2021.02.008>.

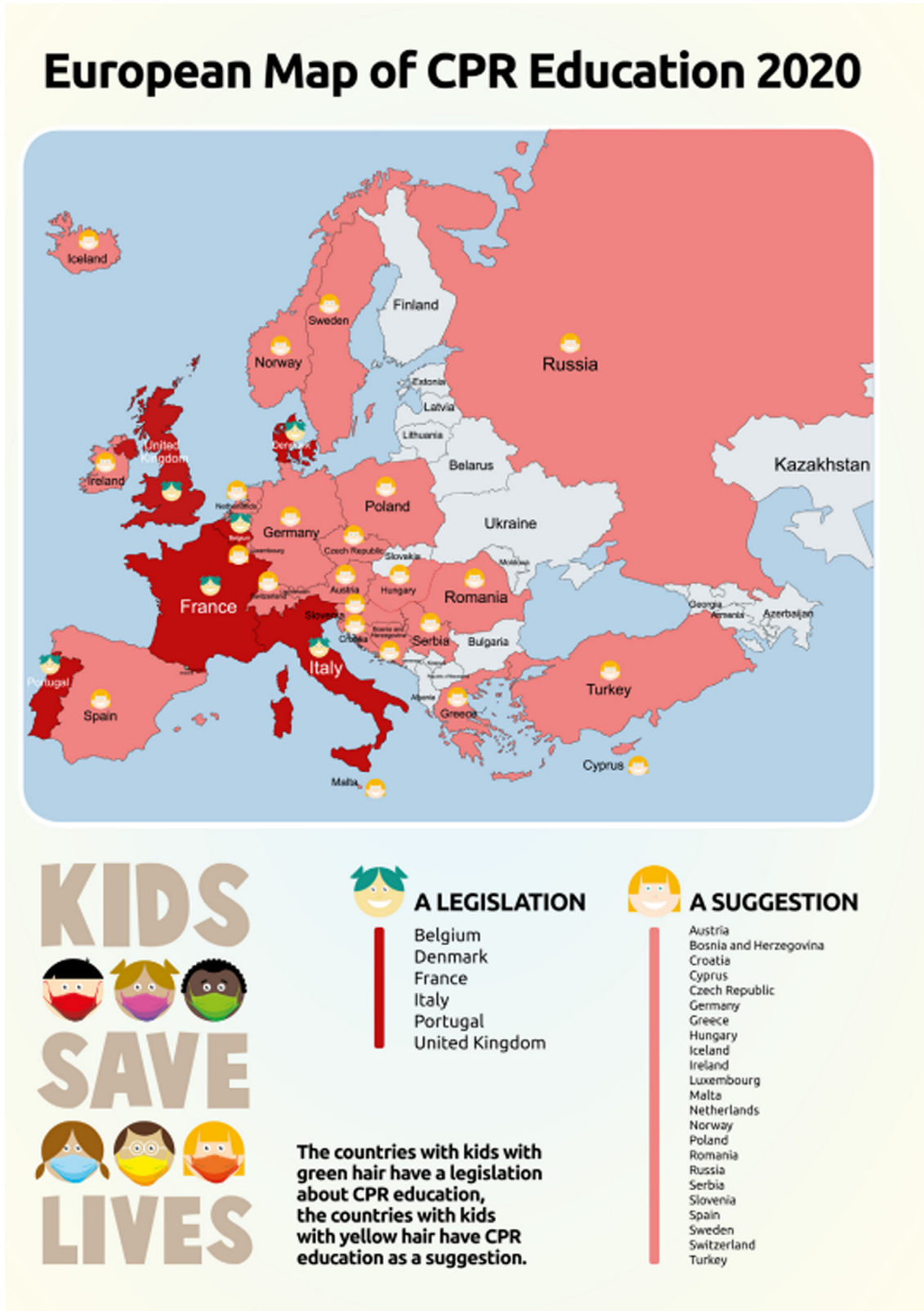


Fig. 2 – European Map of CPR Education 2020 European Resuscitation Council Guidelines 2021: Systems Saving Lives: <https://doi.org/10.1016/j.resuscitation.2021.02.008>.

The concept of SSL as a system-level approach lies in the connection between the actors involved in the chain of survival. The goal

is to improve the survival rate of OHCA and/or in-hospital cardiac arrest (IHCA).

The European and World Restart a Heart initiatives

An important strategy for increasing survival rates from OHCA is to educate as many people as possible. Campaigns and action days can be used to raise awareness of cardiac arrest among the general population. The European Restart a Heart initiative was first launched by the ERC in 2013. In November 2022, 10 years after the vote to establish a *European cardiac arrest awareness week*, the ERC celebrated the 10th anniversary at the European Parliament in Brussels. Roberta Metsola, President of the European Parliament, delivered the opening speech via video message and pledged her support in the projects: <https://www.youtube.com/watch?v=4XmuRJJHCcg>.

In 2018, the ILCOR expanded this concept to its global network of resuscitation councils and named it WRAH. On October 16, 2018, the first WRAH took place under the motto "All citizens of the world can save a life." More than 675,000 people were trained in resuscitation worldwide and 12.7 million people could be reached via social media.¹⁴ In the following year, more than 206 million people were reached via social media using the hashtag #worldrestartaheart.¹⁴ A total of 5.4 million lay people have been trained through successful activities such as public resuscitation training and flash mobs at iconic places around the world. Some chosen iconic places were the Cologne Cathedral in Germany and the Colosseum in Rome, Italy, where awareness-raising events and CPR training were held¹⁵ (https://www.youtube.com/watch?v=bP_AObvRZ-s&t=6s). In the United Kingdom, mass trainings are organized annually for WRAH by the ambulance services. In 2019, more than 236,318 people were trained there, 81% of them schoolchildren who were educated at the school building.¹⁶

When the Covid-19 virus spread worldwide in 2020 and face-to-face mass training was no longer possible, other alternatives were created, focusing on social media. Thus, the #mysongcansavelives campaign was launched. Famous national and international artists whose songs fit the beat of the resuscitation (100–120 BPM) were contacted and invited to share their songs on social media platforms with the hashtag and the message of WRAH to their followers. Many world-famous artists such as the Vienna Philharmonic Orchestra, David Garret, and Andrew Lloyd Webber participated.¹⁷

New concepts were also considered to provide resuscitation training at home. Digital resuscitation training, instructions on how to build resuscitation mannequins, photo contests or videos featuring celebrities were realized. Some countries promoted virtual reality apps to learn CPR.¹⁷ In 2021, still in the pandemic, under the hashtag #CPRSavedMyLife, numerous stories of successful resuscitation were published. For WRAH 2022, face-to-face resuscitation training was again possible on many occasions in addition to digital activities.

KIDS SAVE LIVES

In several countries, training schoolchildren in resuscitation has been associated with an increase in lay resuscitation rates.⁷ In Denmark, this concept was already introduced in 2005. The lay resuscitation rate raised from 21% to 45% in 10 years as well as the survival rate after OHCA from 8% to 22% partly due to the widespread introduction of resuscitation training and raising awareness among the population.⁷ After the WHO Statement on KIDS SAVE LIVES in 2015,¹² CPR training for schoolchildren was in 2020 already a legal requirement in 6 European countries and a recommendation in further 23 countries¹¹ (Fig. 2).

The KIDS SAVE LIVES project recommends spending 2 hours per year, starting in 7th grade, to train schoolchildren in resuscitation techniques, e.g., in sports or as part of project days. Training can be

provided either by specially trained teachers from the students' school or e.g., medical support staff.¹⁸ In line with ERC principles, a combination of theory including virtual learning and practical application is recommended. An age of 12 is assumed to achieve a quality of resuscitation comparable to adults.¹⁹ The focus is on the key steps CHECK-CALL-COMPRESS. The aim is to teach 1) the correct recognition of a cardiac arrest, 2) the sufficient placing of an emergency call, and 3) chest compression correctly performed in terms of compression depth and frequency. In addition, schoolchildren should be encouraged to pass on their knowledge as homework to their families, thus serving as multipliers.¹⁹

In Germany there has been a resolution and recommendation since 2014 to introduce resuscitation training at all schools.¹⁸ Due to the federal system of school curricula, CPR lessons have not yet been implemented nationwide. There are several efforts across the country to implement CPR education, e.g.:

In 2021, the campaign #ichrettedeinleben (engl.: „I save your life") was initiated by the German Resuscitation Council, together with famous influencers and many others. It aimed to collect signatures for a petition for compulsory resuscitation lessons for schoolchildren from the 7th grade onwards throughout Germany. A total of 84,972 signatures were collected within a few weeks. Through the support of numerous social media influencers, it achieved a great deal of media attention.²⁰

In the United Kingdom, it has been determined that teaching resuscitation will be a statutory part of the curriculum in all four countries from 2022.²¹

In Italy, a law was passed in 2015 for mandatory resuscitation training for schoolchildren in primary and secondary schools nationwide. Furthermore, following the latest ERC guidelines, a "SSL Italian Law" was introduced, matching the new chapter SSL. With this Law, Italy takes a pioneering role in Europe and accelerates the implementation of the SSL concept in the community.²²

Conclusions

Raising awareness campaigns like WRAH and schoolchildren education in resuscitation can lead to an increase in resuscitation rates by lay people. In terms of SSL according to ERC guidelines, they are centrally important links in a patient's chain of survival. Some European countries have been able to significantly increase lay resuscitation rates in recent years through national initiatives. Targeted promotion of individual strategies is an important component in achieving a sustained and significant increase in the survival rate of patients with OHCA.

CRedit authorship contribution statement

Lina Horriar: Writing – original draft, Writing – review & editing. **Nadine Rott:** Writing – review & editing. **Federico Semeraro:** Writing – review & editing. **Bernd W. Böttiger:** Conceptualization, Writing – review & editing, Supervision.

Declaration of Competing Interest

The authors declare the following financial interests/personal relationships which may be considered as potential competing interests: Lina Horriar and Nadine Rott are employees of the German Resusci-

tation Council. Nadine Rott is member of editorial board of Resuscitation plus and member of ILCOR Communications Committee. Federico Semeraro is the Chair-Elect of the European Resuscitation Council, Member of the Basic Life Support (BLS) Task Force of the International Liaison Committee on Resuscitation (ILCOR) and Chair of the ILCOR Social Media Working Group. Bernd W. Böttiger is treasurer of the European Resuscitation Council (ERC), Founder of the ERC Research NET, Chairman of the German Resuscitation Council (GRC), Member of the „Advanced Life Support (ALS) Task Force of the International Liaison Committee on Resuscitation (ILCOR), Member of the Executive Committee of the German Interdisciplinary Association for Intensive Care and Emergency Medicine (DIVI), Founder of the “Deutsche Stiftung Wiederbelebung”, Federal Medical Advisor of the German Red Cross (DRK), Member of the Advisory Board of the “Deutsche Herzstiftung”, Co-Editor of “Resuscitation”, Editor of the Journal “Notfall + Rettungsmedizin”, Co-Editor of the Brazilian Journal of Anesthesiology. He received fees for lectures from the following companies: Forum für medizinische Fortbildung (FomF), Baxalta Deutschland GmbH, ZOLL Medical Deutschland GmbH, C.R. Bard GmbH, GS Elektromedizinische Geräte G. Stemple GmbH, Novartis Pharma GmbH, Philips GmbH Market DACH, Bioscience Valuation BSV GmbH.

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