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Editorial

The European Resuscitation Council Cardiac Arrest Dashboard Service – Visualising out-of-hospital cardiac arrest data across Europe

It is well known and scientifically proven that "a picture is worth a thousand words".[1] With this in mind, the European Resuscitation Council (ERC) established and supported a project to create a graphical overview of incidence and outcome of out-of-hospital cardiac arrest (OHCA) across Europe. The resulting ERC Cardiac Arrest Dashboard was launched at ERC Barcelona 2023, https://cpr-dashboard.erc.edu/ (Fig. 1).

The ERC Guidelines 2021 highlight the importance of monitoring the epidemiology of cardiac arrest in order to understand the burden of disease, identify variation, facilitate learning from best practice and drive quality improvement initiatives.[2] The European Registry of Cardiac Arrest (EuReCa) project, initiated in 2007, sought to bring together like-minded individuals from across Europe to share information on the epidemiology of cardiac arrest.[3,4]

The first report from the EuReCa network in 2008 described the incidence, treatment and outcomes from 12,446 resuscitation attempts across 5 countries in Europe.[3] The network then grew from 5 to 27 nations who came together in collaboration with the ERC to conduct a multi-centre study, providing the opportunity to uncover differences throughout Europe and help find explanations for these differences.[4] The study analysed data from 10,682 confirmed OHCA which occurred in October 2014, and highlighted that OHCA is still a major public health problem accounting for a substantial number of deaths in Europe. EuReCa ONE also found marked differences in the processes for data collection, definitions of variables and reported outcomes following OHCA all over Europe.[5]

Based on the experience from EuReCa ONE, a study exploring how bystanders were defined in different countries was performed.[6] In this study, substantial variations in the definition of bystander were found, and a more in-depth description of bystanders was made for our next study. Using data collected from 1st October to 31st December 2017, EuReCa TWO examined data from 37,054 OHCA drawn from 28 collaborating registries.[7] Focusing on process measures for OHCA, the study highlighted wide variation in bystander CPR rates across Europe. A subsequent study using EuReCa TWO data confirmed the benefits of cardiopulmonary resuscitation (ventilation and chest compression).[8]

The commitment of the EuReCa team and the coordinators in every country (National Coordinators) to the original vision of EuReCa remains strong. This has led to the EuReCa THREE initiative – an international, prospective, multi-centre, three-month (1st September to 30th November 2022) survey of epidemiology, treatment and outcome of patients with out-of-hospital cardiac arrest in Europe.[9]

The strength of the EuReCa epidemiology projects are that they allow a deep dive in to patient characteristics, treatments and outcomes across the participating countries and jurisdictions. In order to increase the accessibility and visibility of the data, the ERC implemented and sponsored the ERC Dashboard Project to display European OHCA data on a map/dashboard hosted by the ERC.

The vision for this project was, starting with EuReCa results, to summarise the epidemiology/progression of out-of-hospital cardiac arrest from available data in European cardiac arrest registries. Specific aims of the project were:

- To supplement the detailed analyses of the EuReCa projects with a simple graphical and numerical summary of existing cardiac arrest data from European registries (initially out-of-hospital data).
- Extend participation in the EuReCa collaboration.
- Highlight the activities of cardiac arrest registries in Europe by making information about these registries easily accessible.
- Be a reliable source of information about registries and main results.
- For out-of-hospital cardiac arrest, to eventually act as a source of information about EMS systems in individual countries.

The ERC Cardiac Arrest Dashboard is primarily designed for health professionals and policy makers with an interest in the epidemiology of OHCA. It provides high level, publicly available information about the OHCA incidence, management and outcomes in

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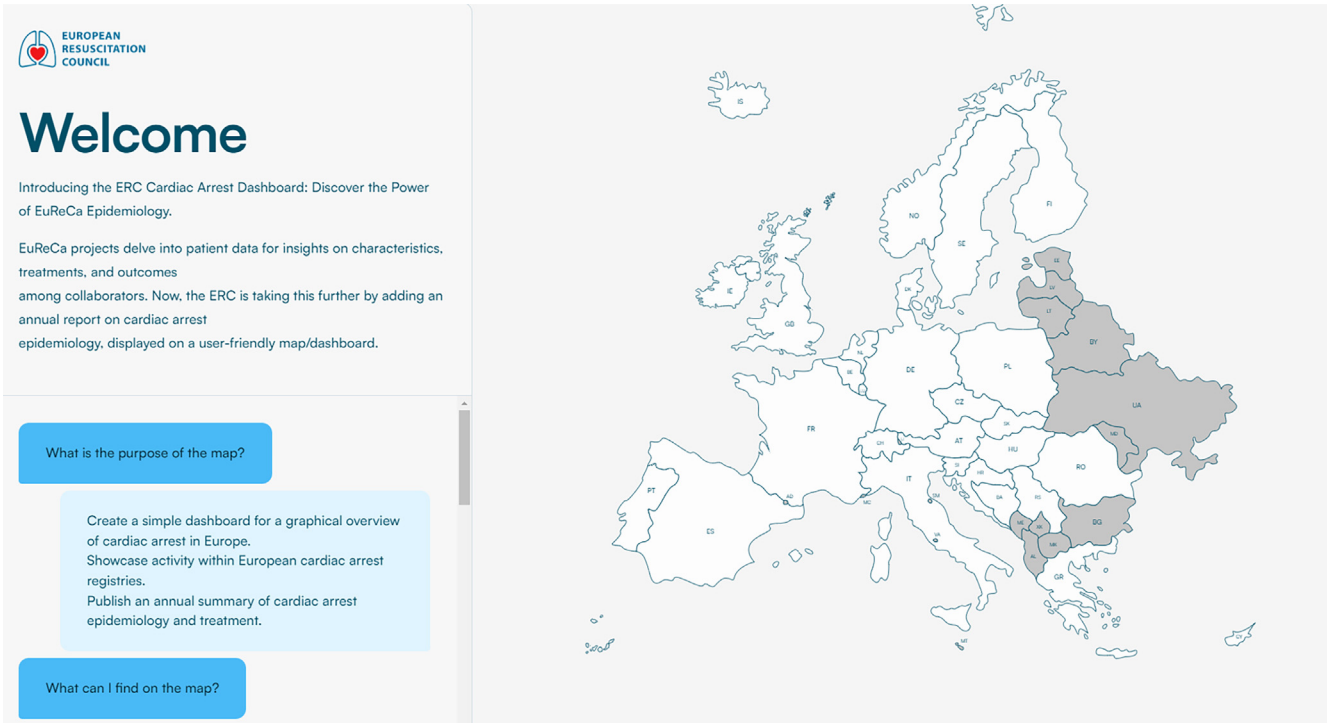

Fig. 1 – The European Resuscitation Council Cardiac Arrest Dashboard Service.

Europe and may also be of interest to researchers as a starting point for understanding European OHCA epidemiology. It is important to note that all data displayed in the Dashboard will have been previously published and publicly available i.e. the Dashboard is not designed to be a source of new OHCA epidemiological data. The ERC Cardiac Arrest Dashboard currently includes data from EuReCa TWO for all 28 participating countries and will be updated with EuReCa THREE data once study results have been published in a peer-reviewed clinical journal.

Future proofing the ERC cardiac arrest Dashboard

The Dashboard includes country-specific data, including a link to the National Resuscitation Council, national emergency number(s) and links to national first responder Apps. There is substantial potential for the Dashboard to develop and include further country-specific data, including information about national OHCA registries, EMS systems and potentially in-hospital cardiac arrest results. As the Dashboard develops, it is planned that an annual summary of European cardiac arrest epidemiology will be published in Resuscitation Plus.

The Dashboard Working Group have also developed an 'ideal' dataset that represents the minimum OHCA results that should be available in the Dashboard. In future the ERC plan to allow individual European OHCA Registries to add their own previously published results to the Dashboard. With that in mind, European Registry managers are encouraged to consider ensuring that their published results include results that match this 'ideal' dataset, so that their national data can be included in the ERC Cardiac Arrest Dashboard:

1. Incidence of EMS-treated OHCA/100,000 population/year.
2. Percentage bystander-witnessed/EMS-witnessed and unwitnessed cases.
3. Incidence bystander-witnessed/EMS-witnessed and unwitnessed/100,000 population/year.
4. Percentage of non-EMS-witnessed patients who received bystander CPR.
5. Incidence of non-EMS-witnessed patients who received bystander/100,000 population/year.
6. Percentage of non-EMS-witnessed patients who received a shock before EMS arrival
7. Incidence of non-EMS-witnessed patients who received a shock before/100,000 population/year.
8. Percentage of patients with ROSC at any stage pre-hospital
9. Incidence of patients with ROSC at any stage pre-hospital/100,000 population/year.
10. Percentage of patients admitted alive to hospital.
11. Incidence of patients admitted alive to hospital/100,000 population/year.
12. Percentage patients survived to hospital discharge.
13. Incidence of patient survival to hospital discharge/100,000 population/year.
14. Percentage of patients who survived to 30 days.
15. Incidence of patients who survived to 30 days/100,000 population/year.

While the primary aim is to display results country by country in graphical and numerical format, as the Dashboard progresses, the ability to display data in a more comparative format will be developed e.g. to produce a table of bystander CPR rates across different European countries. The possibility of being able to apply a filter to the

data will also be explored e.g. to display only certain countries for certain results.

The ERC has used results from EuReCa TWO to draw a sketch of European OHCA Epidemiology. With the cooperation of European Cardiac Arrest Registries and National Resuscitation Councils, this sketch will be developed to create a fuller and more detailed picture of cardiac arrest incidence, management and outcomes across Europe.

CRediT authorship contribution statement

Siobhán Masterson: Conceptualization, Writing – original draft, Supervision. **Ingvild B.M. Tjelmeland:** Writing – review & editing.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Siobhán Masterson *

National Ambulance Service, Health Service Executive, Dooradoyle House, Dooradoyle, Limerick, Ireland

Ingvild B.M. Tjelmeland

Division of Prehospital Services, Oslo University Hospital, Norway
Faculty of Medicine, Institute of Clinical Medicine, University of Oslo, Norway
University Hospital Schleswig-Holstein, Institute for Emergency Medicine, Kiel, Germany

* Corresponding author.