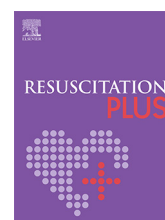


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Short paper

More than 302 million people reached and over 2,200,000 trained in cardiopulmonary resuscitation worldwide: The 2021 ILCOR World Restart a Heart initiative



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Abstract

Immediate bystander CPR after an out-of-hospital-cardiac arrest is likely to save hundreds of thousands of lives worldwide each year. International Liaison Committee on Resuscitation launched the World Restart a Heart initiative on October 16, 2018. In 2021 more than 2,200,000 persons were trained and at least 302,000,000 people were reached by WRAH global collaboration through print and digital media making it the highest-impact year since its inception. We strive for real success when CPR training and awareness become a year-round activity in all countries and all the citizens of the world realize that "Two Hands Can Save a Life!"

Keywords: WRAH 2021, Resuscitation, Two Hands Can Save a Life!

Background

Cardiac arrest is a major international public health problem. The estimated annual incidence of emergency medical services (EMS)-treated out-of-hospital cardiac arrest (OHCA) is 30.0–97.1 individuals per 100,000 population.¹ The brain starts to die after 3–5 min following the circulatory arrest and overall survival rates after OHCA are 2–10%.² Chances of survival after OHCA are reduced by 10% every minute but this may be improved to 2% to 3% per minute with immediate and effective cardiopulmonary resuscitation (CPR). In most developed countries, it takes at least 8–12 minutes for emer-

gency medical services (EMS) to arrive on the scene after a victim's collapse, thus, they fail to deliver immediate CPR in the crucial first few minutes after collapse. Despite many improvements in EMS and treatment recommendations for cardiac arrest patients, the overall survival rates remain very low.³ As many as 70% of the OHCAs occur at home where there is a higher opportunity to be witnessed.⁴ Thus, immediate bystander CPR could be possible in many cases if all citizens know CPR and how to deliver it until trained EMS reaches the scene. Currently, the bystander CPR rate for OHCA differs significantly from 5–80% depending on the region or country.^{5–6} The early initiation of bystander CPR increases survival by two to four times and is likely to save hundreds of thousands of lives worldwide each

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¹ The members of the ILCOR WRAH are listed in Appendix 1 at the end of the article.

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Table 1 – WRAH-2021 Working group Countries, Institutions and activities: Number of people trained in CPR and reached CPR awareness.

Council/Organisation	Activities	People trained	People reached	Total
ILCOR	Online promotion of events		37,832	37,832
American Heart Association (AHA)	<ul style="list-style-type: none"> • Train the Trainer event 	3,04,557	16,73,85,939	16,76,94,530
	<ul style="list-style-type: none"> • Live stream of hands-only CPR demonstration • Social media campaign • PR campaign • Email marketing campaign 			
Australia & New Zealand Council of Resuscitation (ANZCOR)	<ul style="list-style-type: none"> • Health hub to promote CPR 	1,00,000	2,18,816	3,18,816
	<ul style="list-style-type: none"> • In person training event • The Future Is Shocking webinar • CPR Saved My Life (3 survivor stories) 			
European Resuscitation Council (ERC)	<ul style="list-style-type: none"> • Survivor stories: CPR Saved My Life from perspective of survivor and savior 	49,306	1,20,67,399	1,21,16,705
	<ul style="list-style-type: none"> • “One project one year” to support the promotion of CPR • “KIDS SAVE LIVES” initiative for children to have 2 hours of CPR in school in Bosnia and Herzegovina • Pilot CPR training for trainees of different football clubs in Luxembourg • Campaign for a nationwide mandatory introduction of resuscitation lessons from the 7th grade in Germany: A petition with 84,972 signatures • Nationwide Restart A Heart campaign (UK) and CPR activities in 33 Member councils • Global digital training (St. John Ambulance) • Viva! Italian cardiac arrest awareness campaign 			
Heart & Stroke Foundation Canada (HSFC)	<ul style="list-style-type: none"> • Digital and live CPR events 		20,41,483	20,41,483
	<ul style="list-style-type: none"> • French and English toolkit for all the instructors • A ninety-second video teaching CPR on social media 			
Resuscitation Council of Asia (RCA)	<ul style="list-style-type: none"> • CPR Saved My Life 	6,31,193		6,31,193
Resuscitation Council of Southern Africa (RCSA)	<ul style="list-style-type: none"> • Hands on CPR training Singapore and Japan • Online promotion and radio interviews 	3,094	20,161	23,255
	<ul style="list-style-type: none"> • CPR Saved My Life • Trainings for children in underprivileged areas 			
Indian Resuscitation Council Federation (IRCF)	<ul style="list-style-type: none"> • Online and hands-on training for health care workers, other professionals and laypersons • Mandatory CPR training for Medical students in India • Hybrid (digital followed by on-site) CPR training module eSanjeevani by IAP and AIIMS Patna • Abdul Kalam CPR week (21st-27th July) 	10,16,070	30,00,00,000	30,10,16,070
Pan-Arabian Resuscitation Council	<ul style="list-style-type: none"> • Face-to-face trainings 	1,12,000	2,00,000	3,12,000
	<ul style="list-style-type: none"> • Social media campaigns 			
Brazil Resuscitation Council	<ul style="list-style-type: none"> • Face-to-face trainings • Kids Save Lives projects • Mentoring and scholarships • CPR Saved My Life • Online trainings 	901		901
Sri Lanka	<ul style="list-style-type: none"> • Kids Save Lives trainings • Online CPR training for 5000 medical schools 		5,000	5,000
International Federation of the Red Cross (IFRC)	<ul style="list-style-type: none"> • CPR Events in 19 Red Cross National Societies 	1,571	11,70,357	11,71,928
Total Reported		22,18,692	48,31,47,277	48,53,69,713
Total number after adjusting potential overlap in reported figures		22,18,692	30,00,00,000	30,22,18,692

The numbers of people trained through in-person and/or online activities and reached through social media, television, radio and print media were self-reported by the participating councils and organizations to the ILCOR WRAH working group. Reported data were confirmed through discussion among all the participating councils and organizations through teleconference meetings and sharing of the draft through emails.

year. This single intervention provides a greater chance of improving survival rates over any other single intervention by medical professionals.⁷

Reporting method

The participating councils and organizations self-reported their major online and in-person activities with the number of people trained and reached through social media, television, radio and print media. Reported data were confirmed through discussion among all the participating councils and organizations through teleconference meetings and sharing of the draft through emails (Table 1). Being a report on training and awareness initiatives, ethical clearance or consent was not applicable.

World Restart a Heart initiative

To achieve the goal of better survival after cardiac arrest, the International Liaison Committee on Resuscitation (ILCOR) launched the World Restart a Heart (WRAH) initiative on Oct 16, 2018, with a logo and the motto "All citizens of the world can save a life".³ Before this the European Resuscitation Council established the European Restart a Heart Day in 2012, with the support of 400 Members of the European Parliament. In 2015 the World Health Organization endorsed the European Restart a Heart and the KIDS Save Lives initiatives.⁸ To achieve the goal of reducing OHCA globally, all seven ILCOR councils (American Heart Association, European Resuscitation Council, Heart and Stroke Foundation of Canada, Australian and New Zealand Committee on Resuscitation, Resuscitation Council of Southern Africa, Inter American Heart Foundation, and Resuscitation Council of Asia) came together in 2018 to endorse and support the WRAH initiative. In subsequent years many other organizations active in the field of resuscitation such as the Indian Resuscitation Council Federation (IRCF), Pan-Arabian Resuscitation Council, Brazil Resuscitation Council, International Federation of the Red Cross and Red Crescent (IFRC), St. John Ambulance, European Society For Emergency Medicine (EUSEM), International Federation of Emergency Medicine (IFEM), World Federation of Intensive and Critical Care (WFICC), World Federation of Societies of Anaesthesiologists, and the European Society of Anaesthesiology, along with other clinicians and organization active in resuscitation agreed to participate in a truly global WRAH collaborative making this, rapidly growing collective an outstanding success over the last 4 years.

Though WRAH is celebrated each year on the 16th day of October, it is not essential that all activities have to take place on one particular day but that it is done as close to that day as possible. During the weeks before and after October 16th, people are trained in basic resuscitation using simple methods such as the "CHECK-CALL-COMPRESS" approach. In the year 2018, 12.7 million people were reached via social media and at least 675,000 individuals were trained.⁹ In 2019 "iconic places" was the main theme and 206 million people were reached via social media and 5.4 million people were trained in resuscitation worldwide, often in front of iconic places around the world.¹⁰ WRAH in 2020 necessitated a different approach as the world was plunged into the coronavirus pandemic and in-person training was halted. The "Your two hands can save a life" motto was spread using new strategies and creative ideas as mass resuscitation events were not possible in most countries. One of the

most successful ideas for 2020 was the "#MySongCanSaveLives" campaign. Many world-famous artists participated in this campaign, such as the Vienna Philharmonic Orchestra, David Garret, Greg Page, Andrew Lloyd Webber, and many more.¹¹

WRAH activities in 2021

In 2021, WRAH continued largely in the digital space by placing the spotlight on survivors! Using the hashtag #CPRSavedMyLife, stories of CPR survivors who are still with us due to bystander CPR were shared through many social and print media channels. The campaign once again underlined the vital importance of CPR in out-of-hospital settings. ILCOR and the broader WRAH collaborating partners actively spread the message that by starting CPR and using a defibrillator before emergency services arrive, we can save up to 200,000 more lives every year. Online, in-person training and awareness campaigns were organized around the world. One of the most important features of WRAH 2021 was the growing partnerships with many new resuscitation councils, supporting organizations, and concerned clinicians who joined the seven constituent councils of ILCOR to spread this mission even further.

Some of the successful activities from our newer partners in 2021 include India's CPR training and awareness drive that witnessed a newer height during the annual campaign with the strategic alignment of various stakeholders towards achieving the goal of training all medical students in CPR within the first 6 weeks of their admission to medical schools as recently set by the national medical commission.¹²⁻¹³ India also proposed the concept of establishing a national CPR registry, which could be relevant for all developing economies to extend the benefits of ILCOR-recommended science.¹⁴ The Pan-Arabian Resuscitation Council trained 112,000 people through face-to-face training and reached 200,000 people through social media. The IFRC reached over 1,170,000 people through media campaigns and trained 1,571 volunteers in CPR through in-person events held in 19 Red Cross National Societies. Through a collaboration with five medical schools and several private schools, Sri Lanka aimed to teach 5,000 students through online training. The Brazil Resuscitation Council held online and face-to-face training on CPR and organized university competitions on saving women's lives. The magnitude of CPR training and the reach of CPR awareness drives in these newer areas is quite encouraging and greatly added to the impact of our longstanding members. Overall 2,218,692 persons were trained in CPR globally. The total number of people reached by all participating councils and organizations was 483,147,277 but there is the possibility of overlap in the count of people reached by different councils through online modes, social media, television, and print media. We can confidently say that there was a minimum reach of at least 300 million i.e. largest regional total from India even after adjusting the potential for overlap between these reported figures, making it the highest impact WRAH since 2018 when it was first launched.

Although 16th October is WRAH day, the real success of WRAH is when it becomes a year-round activity in all countries. India, for example, observed CPR week from 21st to 27th July as Abdul Kalam CPR week in fond memory of the ex-president of India Dr Abdul Kalam Azad who succumbed to sudden cardiac arrest while delivering a lecture at the Indian Institute of Management Shillong on July 27, 2015. Celebrating Abdul Kalam CPR week inspires all Indian

citizens to learn CPR. Similarly, other councils and WRAH partners are requested to find ideas which inspire their citizens and then partner with WRAH to share that inspiration globally.

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CRediT authorship contribution statement

Lokesh Tiwari: Writing – original draft, Writing – review & editing, Resources. **Andrew Lockey:** Conceptualization, Methodology, Writing – review & editing, Validation, Supervision. **Bernd.W. Böttiger:** Conceptualization, Methodology, Writing – review & editing,

Validation, Supervision. **Nadine Rott:** . **Amber V. Hoover:** Data curation, Validation, Writing – review & editing. **SSC Chakra Rao:** Data curation, Resources. **Rakesh Garg:** Resources, Writing – review & editing. **Lokesh R Edara:** Data curation, Resources.

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.

Acknowledgement

The ILCOR Board, Social Media Committee and members.

Appendix 1

ILCOR WRAH collaborators

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2	Abdulmajeed Khan	Heraa General Hospital	Saudi Arabia
3	Aldus Smith	Resuscitation Council of South Africa	South Africa
4	Baljit Singh	Indian Resuscitation Council Federation	India
5	Barbara Kelly	Heart & Stroke	Canada
6	Cianna Levi	American Heart Association	USA
7	Farhan Bhanji	Faculty of Medicine and Health Sciences, McGill University	Canada
8	Federico Semeraro	Department Anaesthesia, Intensive Care and EMS, Maggiore Hospital, Bologna	Italy
9	George Woods	St John Ambulance	England
10	Hayley Rosenthal	Resuscitation Council of Southern Africa	South Africa
11	Heleen Van Grootven	European Resuscitation Council	Belgium
12	Jacopo Pagani	Azienda ospedaliero-universitaria Sant'Andrea	Italy
13	Kathleen Pitches	European Resuscitation Council	Belgium
14	Kathy Bodmer	Resuscitation Council of Southern Africa	South Africa
15	Koen Monsieurs	Antwerp University Hospital and University of Antwerp / European Resuscitation Council	Belgium
16	Kevin Nation	New Zealand Resuscitation Council	New Zealand
17	Maria José Carvalho Carmona	Faculdade de Medicina da Universidade de São Paulo	Brazil
18	Marios Georgiou	American Medical Center	Cyprus
19	Maaret CASTRÉN	ILCOR	Finland
20	Monica Sales	American Heart Association	USA
21	Maureen O'Connor	San Diego Project Heart Beat	USA
22	Mukul Kapoor	Indian Resuscitation Council Federation	India
23	Naomi Kondo Nakagawa	Faculdade de Medicina da Universidade de São Paul	Brazil
24	Nilmini Wijesuriya	Resuscitation Council- College of Anaesthesiologists and Intensivists of Sri Lanka	Sri Lanka
25	Pascal Cassan	International Federation of Red Cross and Red Crescent	France
26	Raffo Escalante-Kanashiro	Instituto Nacional de Salud del Niño	Peru
27	Rasesh Diwan	Indian Resuscitation Council Federation	India

(continued)

S No	Name	Institution	Country
28	Robert Neumar	University of Michigan	USA
29	Salomé Boucif	Global first aid reference centre	France
30	Shelley Parker	Heart & Stroke	Canada
31	Swee Han Lim	Singapore General Hospital	Singapore
32	Teghan Mear	New Zealand Resuscitation Council	New Zealand
33	Tzong-Luen Wang	Fu-Jen Catholic University/ Resuscitation Council of Asia	Taiwan
34	Vinay Nadkarni	University of Pennsylvania Perelman School of Medicine	USA

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REFERENCES

- Kiguchi T, Okubo M, Nishiyama C, Maconochie I, Ong MEH, Kern KB, et al. Out-of-hospital cardiac arrest across the World: First report from the International Liaison Committee on Resuscitation (ILCOR). *Resuscitation* 2020;152:39–49. <https://doi.org/10.1016/j.resuscitation.2020.02.044>. Epub 2020 Apr 6 PMID: 32272235.
- Böttiger BW, Bossaert LL, Castrén M, Cimpoesu D, Georgiou M, Greif R, et al. Board of European Resuscitation Council (ERC): Kids Save Lives – ERC position statement on school children education in CPR: hands that help – Training children is training for life. *Resuscitation* 2016;105:A1–3.
- Böttiger BW, Lockety A, Aickin R, Castren M, de Caen A, Escalante R, Kern KB, Lim SH, Nadkarni V, Neumar RW, Nolan JP, Stanton D, Wang TL, Perkins GD. “All citizens of the world can save a life” – The World Restart a Heart (WRAH) initiative starts in 2018. *Resuscitation* 2018;128:188–90. <https://doi.org/10.1016/j.resuscitation.2018.04.015>. Epub 2018 Apr 19 PMID: 29679697.
- Tsao CW, Aday AW, Almarzooq ZI, Alonso A, Beaton AZ, Bittencourt MS, et al. Heart Disease and Stroke Statistics-2022 Update: A Report From the American Heart Association Epub 2022 Jan 26. Erratum in: *Circulation*. 2022 Sep 6;146(10):e141. PMID: 35078371. *Circulation* 2022;145:e153–639. <https://doi.org/10.1161/CIR.0000000000001052>.
- Gräsner JT, Lefering R, Koster RW, Masterson S, Böttiger BW, Herlitz J, et al. EuReCa ONE-27 Nations, ONE, Europe, ONE Registry: a prospective one month analysis of out-of-hospital cardiac arrest outcomes in 27 countries in Europe. *Resuscitation* 2016;105:188–95.
- Ong MEH, Perkins GD, Cariou A. Outofhospital cardiac arrest: prehospital management. *Lancet* 2018;391:980–98.
- Myat A, Song KJ, Rea T. Outofhospital cardiac arrest: current concepts. *Lancet* 2018;391:970–99.
- Böttiger BW, Van Aken H. Kids save lives – training school children in cardiopulmonary resuscitation worldwide is now endorsed by the World Health Organization (WHO). *Resuscitation* 2015;94:A5–7.
- Böttiger BW, Lockety A, Aickin R, et al. Over 675,000 lay people trained in cardiopulmonary resuscitation worldwide – The “World Restart a Heart (WRAH)” initiative 2018. *Resuscitation* 2019;138:15–7.
- Böttiger BW, Lockety A, Aickin R. Up to 206 million people reached and over 5.4 million trained in cardiopulmonary resuscitation worldwide: The 2019 International Liaison Committee on Resuscitation World Restart a Heart Initiative. *J Am Heart Assoc* 2020;9:e017230.
- Greg Page. Keep the beat going, 2020. (Accessed 07 July 2021, at https://www.youtube.com/watch?v=_kvli78HIRk).
- Ahmed SM, Garg R, Divatia JV, Rao SC, Mishra BB, Kalandoor MV, et al. Compression-only life support (COLS) for cardiopulmonary resuscitation by layperson outside the hospital. *Indian J Anaesth* 2017;61:867–73.
- Tiwari L, Taneja LN, Kumar P. P0182 / #1507: Effectiveness of IAP BLS foundation course in improving resuscitation knowledge and skill of MBBS students in India. *Pediatric Critical Care Med* 2021;22:116. <https://doi.org/10.1097/01.pcc.0000739072.07154.46>.
- Tiwari L, Jindal A, Gupta V, Taneja LN, Garg R, Edara LR, et al. Concept proposal for IRCF national CPR Registry and update on resuscitation guidelines for infants and children. *J Pediatr Crit Care* 2022;9:48–54.