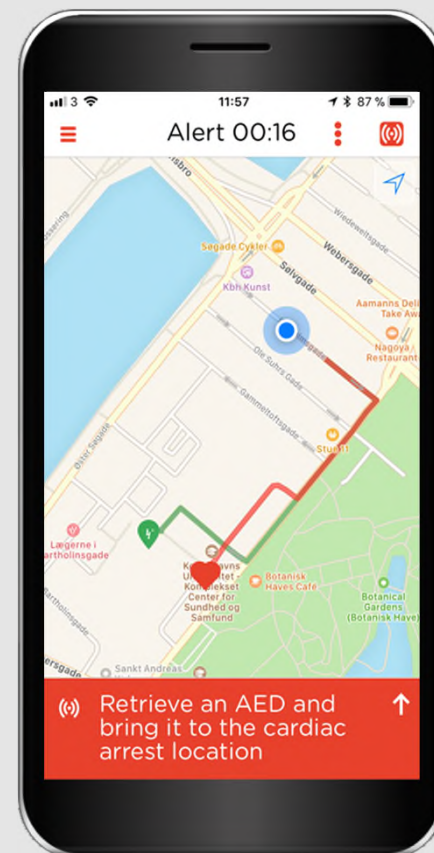


The Volunteer Responder Programme in Denmark

The Heartrunner Project

Linn Andelius, MD, PhD student

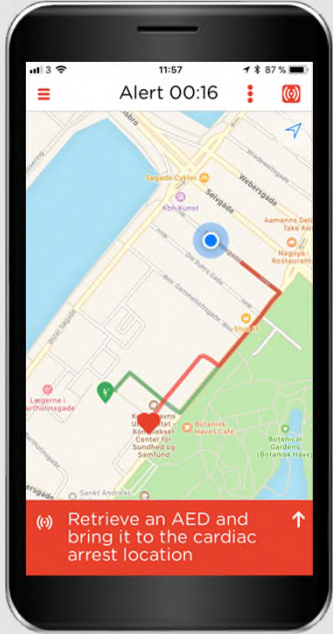
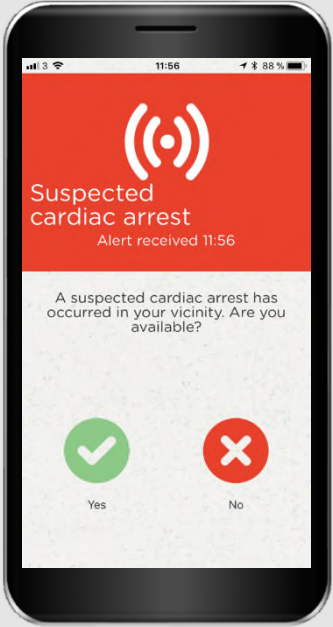
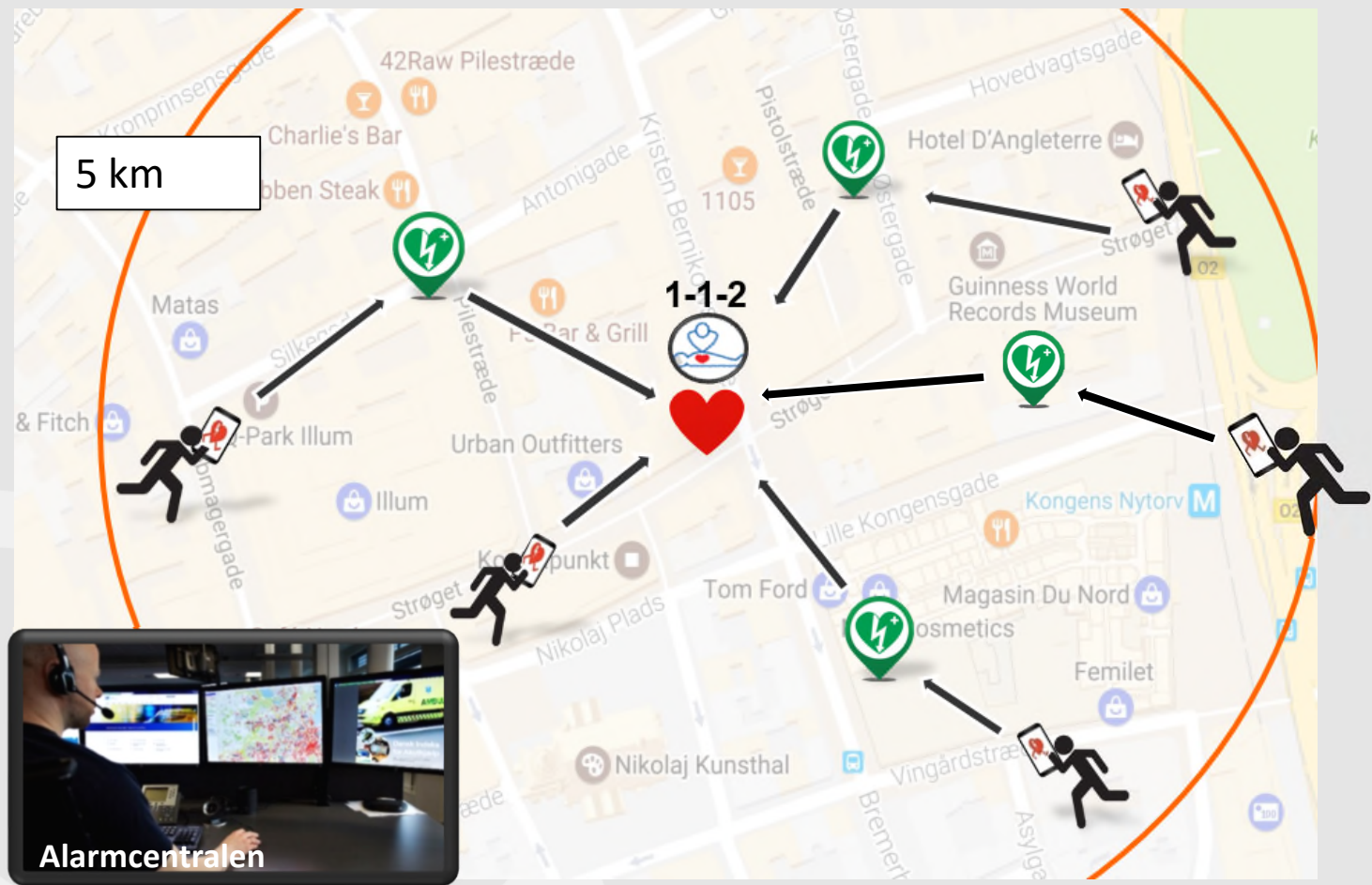
*Copenhagen Emergency Medical Services,
University of Copenhagen, Denmark*



Research grant from **TrygFonden** 

The Danish volunteer responder programme is funded by TrygFonden

Smartphone App Activation



Registered Volunteer Responders

Total: 123 734

Capital Region: 49 189

Central Region: 30 601

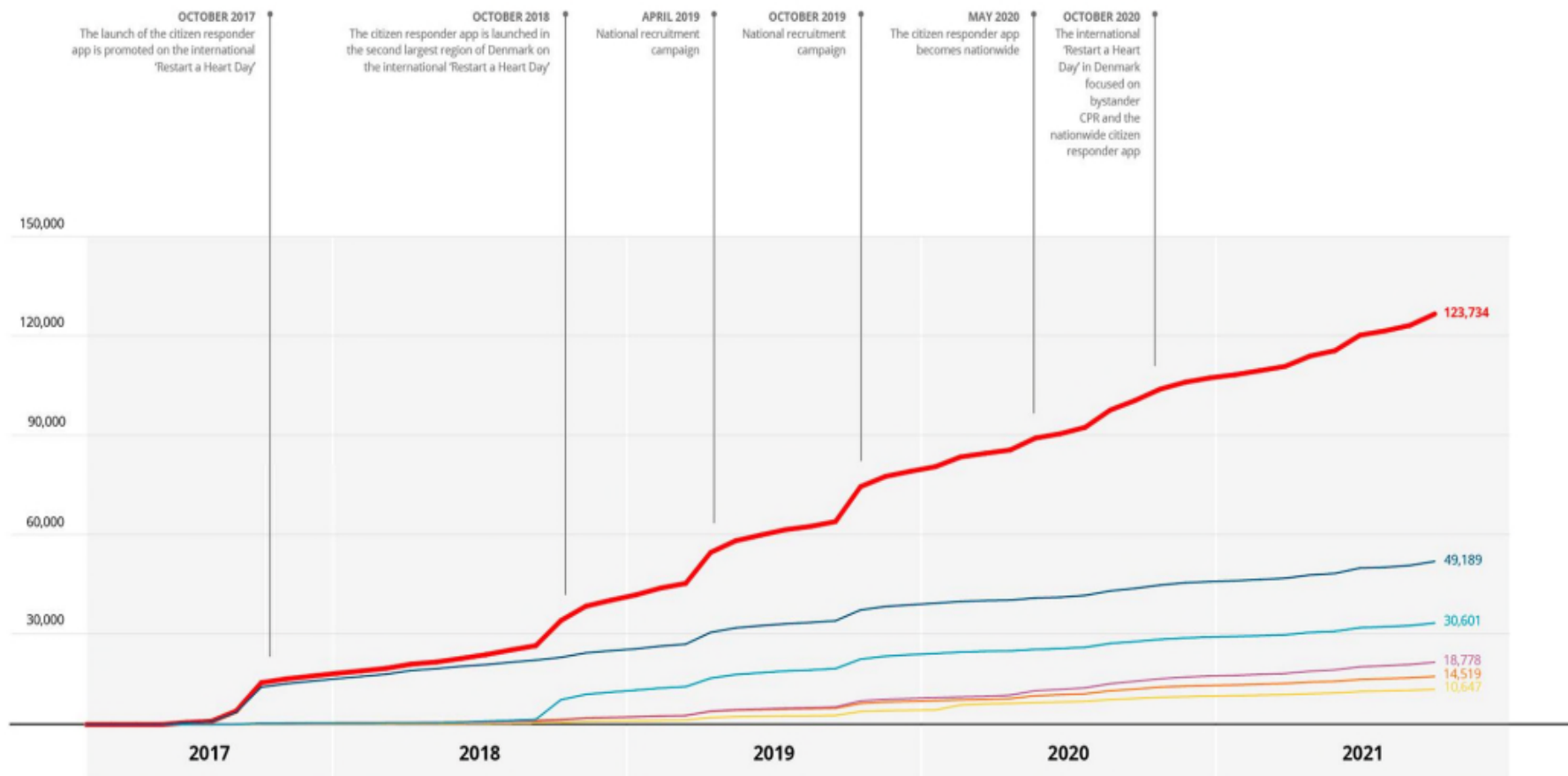
Southern Region: 18 778

Region Zealand: 14 519

Northern Region: 10 647

TrygFonden Citizen Responder Application – Development in Registered Citizen Responders 2017-2021

● TOTAL ● CAPITAL REGION OF DENMARK ● CENTRAL DENMARK REGION ● REGION OF SOUTHERN DENMARK ● REGION ZEALAND ● NORTH DENMARK REGION



Updated September 30 2021

Registered Volunteer Responders

123 734 registered citizen responders in Denmark

2 133 citizen responders/100 000 inhabitants in Denmark



49% women / 51% men

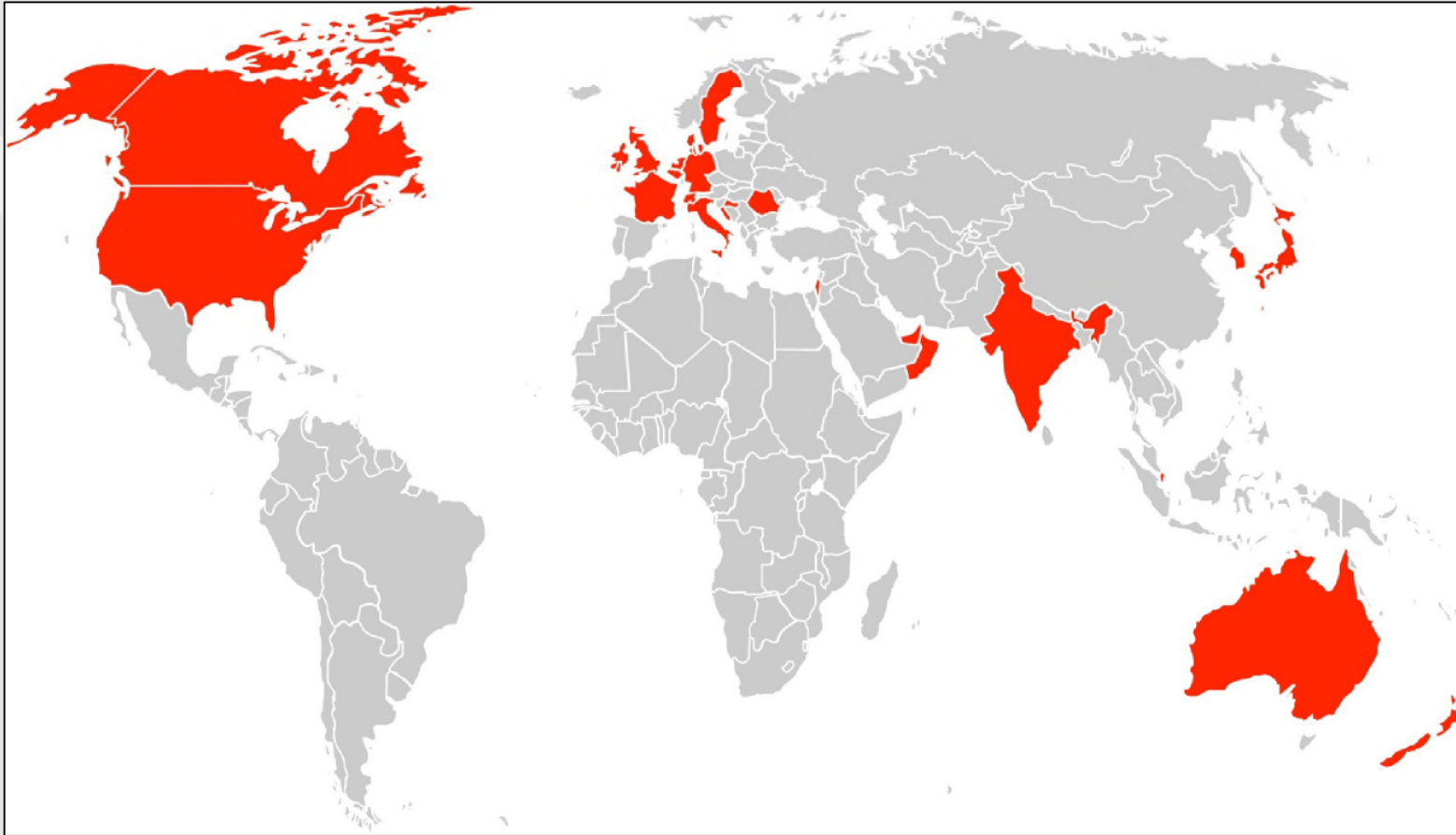


23% health care professionals



96% trained in CPR
41% within the last year

Volunteer Responder Programmes in the World



Valeriano A, Van Heer S, de Champlain F and Brooks S. Crowdsourcing to save lives: A scoping review of bystander alert technologies for out-of-hospital cardiac arrest. *Resuscitation*. 2020.

Volunteer Responder Programmes in the World

2015

NEJM - Ringh et al.
RCT, Stockholm, Sweden
SMS activation
Primary outcome:
Bystander CPR increased
188/305 (61.6 %) vs. 172/360 (47.8 %)

2020

Resuscitation – Scquizzato et al.
Systematic review, 28 studies, 12 systems
Pooled analyses showed OR for bystander
CPR 1.70 (95% CI, 1.11-2.60) and survival
to hospital discharge or 30-days OR 1.51
(95% CI, 1.24 - 1.84)

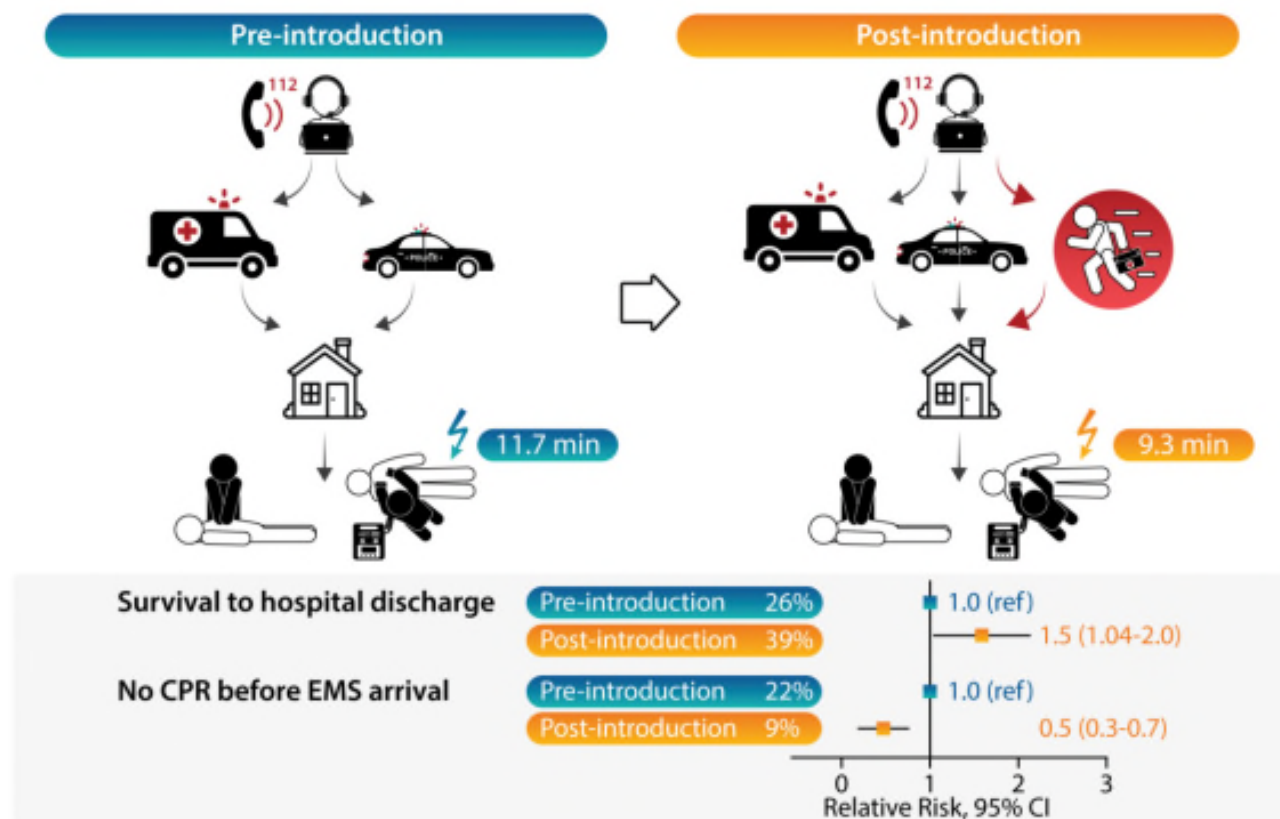
2020

European Resuscitation Guidelines
recommends first responder
programmes
ILCOR guidelines recommends citizen
responder activation (Class 1, Level
of evidence B-NR)

Volunteer Responder Programmes in the World

Graphical abstract

Adding volunteer responders to the EMS-first responder strategy for OHCA in residential areas



European Heart Journal

ACCEPTED MANUSCRIPT

Alert system-supported lay defibrillation and basic life-support for cardiac arrest at home

Remy Stieglis, MSc, Jolande A Zijlstra, PhD, Frank Riedijk, BEng, Martin Smeekes, MD, Wim E van der Worp, BSc, Jan G P Tijssen, PhD, Aeilko H Zwilander, PhD, Marieke T Blom, PhD, Rudolph W Koster, MD, PhD ✉ Author Notes

European Heart Journal, ehab802, <https://doi.org/10.1093/eurheartj/ehab802>

Published: 14 November 2021 Article history ▼

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JACC
Journals



Smartphone Activation of Citizen Responders to Facilitate Defibrillation in Out-of-Hospital Cardiac Arrest

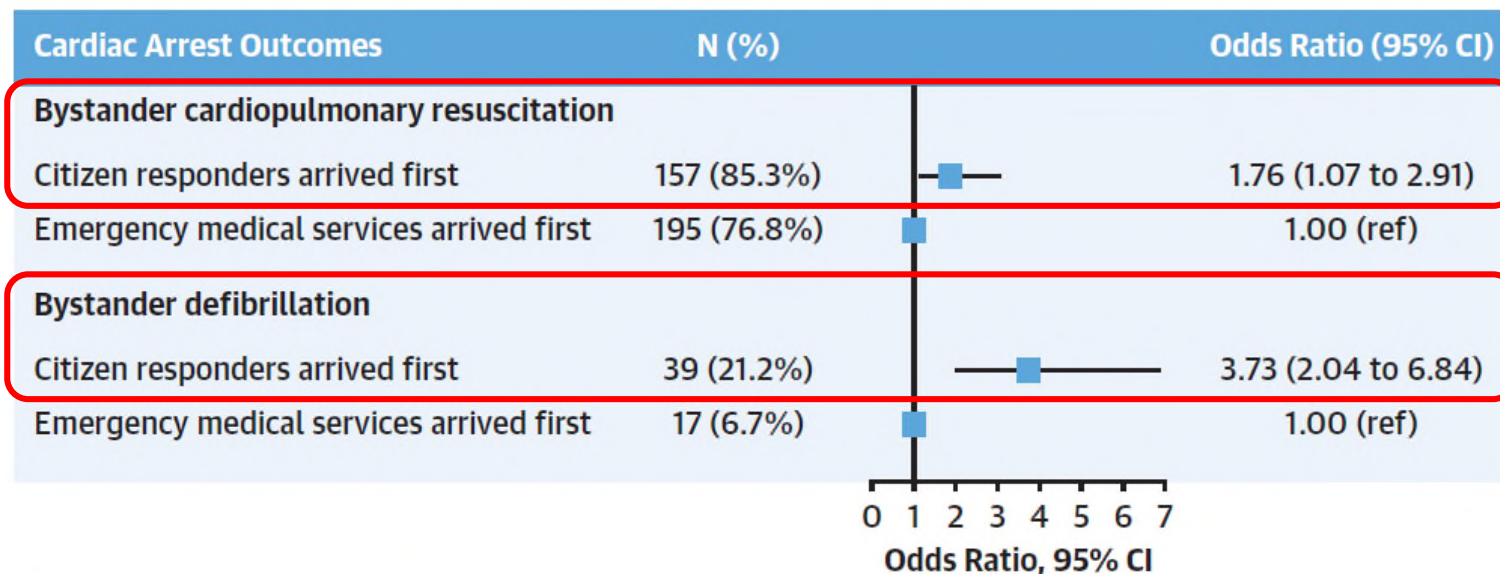
Linn Andelius, MD,^a Carolina Malta Hansen, MD, PhD,^{a,b} Freddy K. Lippert, MD,^a Lena Karlsson, MD, PhD,^{a,b} Christian Torp-Pedersen, MD, DSc,^{c,d} Annette Kjær Ersbøll, MSc, PhD,^e Lars Køber, MD, DSc,^f Helle Collatz Christensen, MD, PhD,^a Stig Nikolaj Blomberg, MSc,^a Gunnar H. Gislason, MD, PhD,^b Fredrik Folke, MD, PhD^{a,b}

438 out-of-hospital cardiac arrest included

42% responders arrived first

58% EMS arrived first

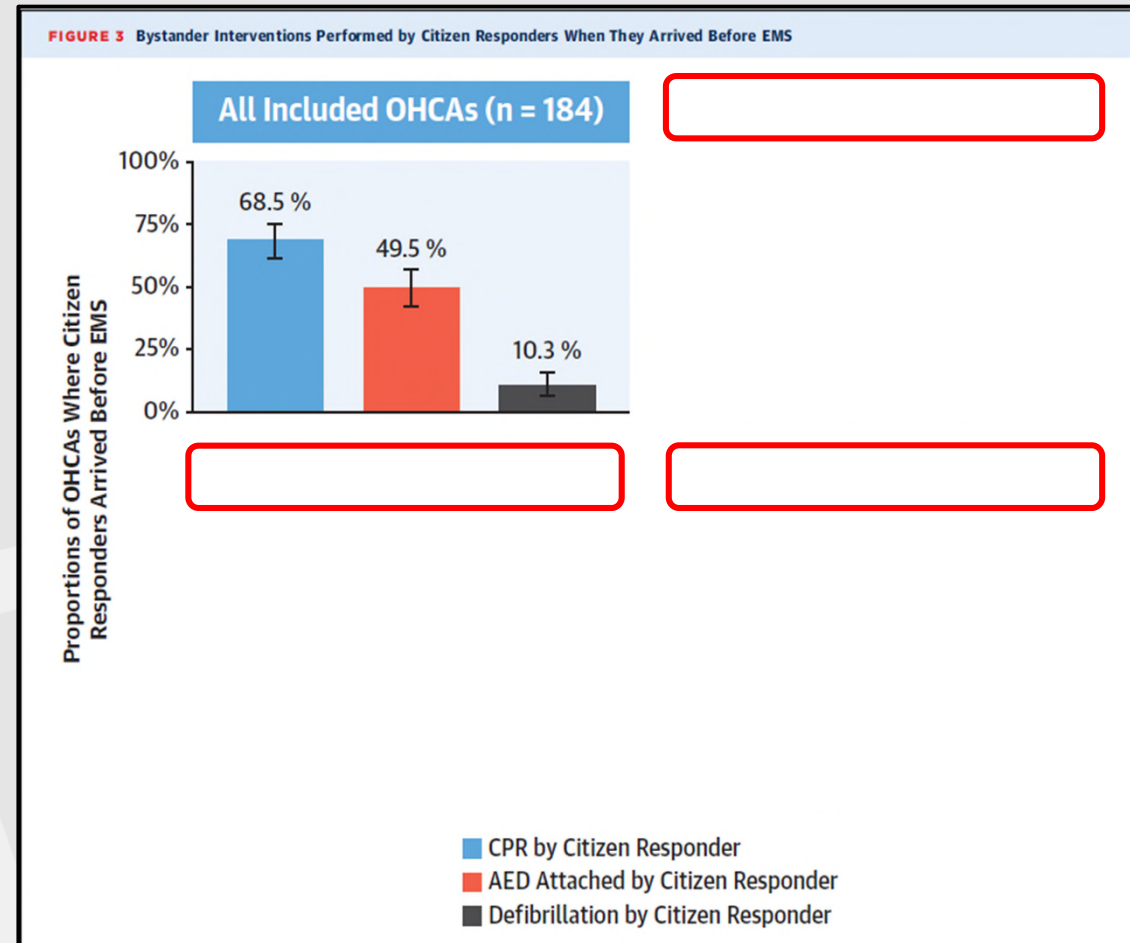
CENTRAL ILLUSTRATION Associations Between Citizen Responders Arriving Before Emergency Medical Services and Bystander Cardiopulmonary Resuscitation and Bystander Defibrillation



Andelius, L. et al. *J Am Coll Cardiol.* 2020;76(1):43-53.

Andelius L, Malta Hansen C, Lippert FK, et al. Smartphone Activation of Citizen Responders to Facilitate Defibrillation in Out-of-Hospital Cardiac Arrest. *J Am Coll Cardiol.* 2020;76(1):43-53.

Volunteer Responders' Interventions









Andelius L, Malta Hansen C, Lippert FK, et al. Smartphone Activation of Citizen Responders to Facilitate Defibrillation in Out-of-Hospital Cardiac Arrest. *J Am Coll Cardiol.* 2020;76(1):43-53.

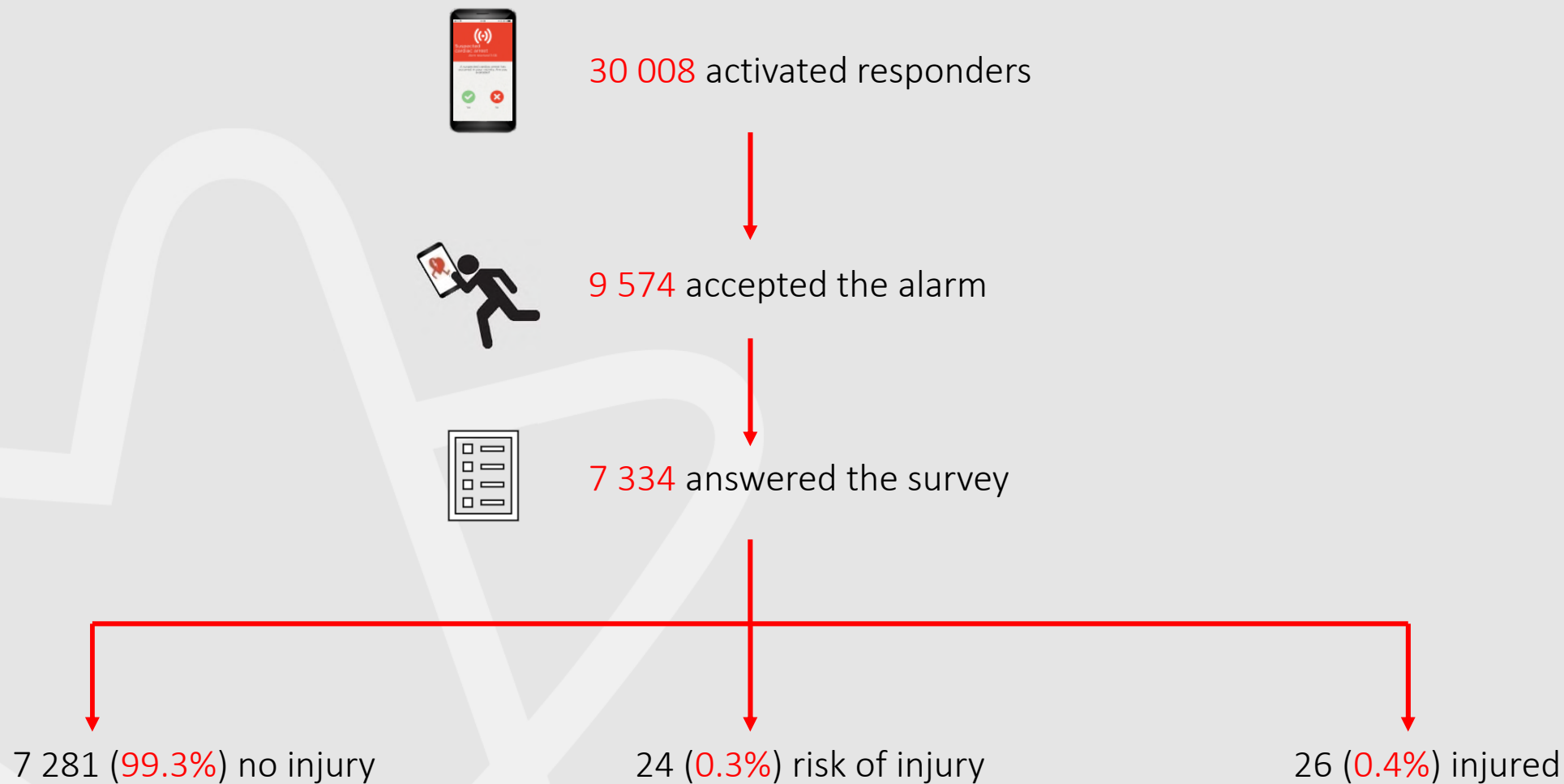
Journal of the American Heart Association

BRIEF COMMUNICATION

Risk of Physical Injury for Dispatched Citizen Responders to Out-of-Hospital Cardiac Arrest

Linn Andelius , MD; Carolina Malta Hansen, MD, PhD; Mads C. Tofte Gregers, MD; Astrid M. Rolin Kragh , MSc;
Lars Køber , MD, DSci; Gunnar H. Gislason , MD, PhD; Annette Kjær Ersbøll, MSc, PhD;
Christian Torp-Pedersen , MD, DSci; Fredrik Folke , MD, PhD

Volunteer Responders at Risk of Injury



Follow-up of Non-Responders



2 472 accepted the alarm



442 (17.9%) did not answer the survey



23 (0.9%) could not be reached

Only one was at risk of injury



Clinical paper
Immediate
responders
application

Astrid Rolin Krag,
Julie Samsøe Kjøl,
Line Zinckernagel,
Carolina Malta Ha



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Available online at ScienceDirect

Resuscitation

journal homepage: www.elsevier.com/locate/resuscitation



EUROPEAN
RESUSCITATION
COUNCIL

Clinical paper

Wellbeing, emotional response and stress among lay responders dispatched to suspected out-of-hospital cardiac arrests

Ellinor Berglund^{a,*}, Erik Olsson^b, Martin Jonsson^a, Leif Svensson^a,
Jacob Hollenberg^a, Andreas Claesson^a, Per Nordberg^a, Peter Lundgren^{c,d,e},
Åsa Högstedt^f, Mattias Ringh^a

ess,
nders
PhD;

Take home messages:

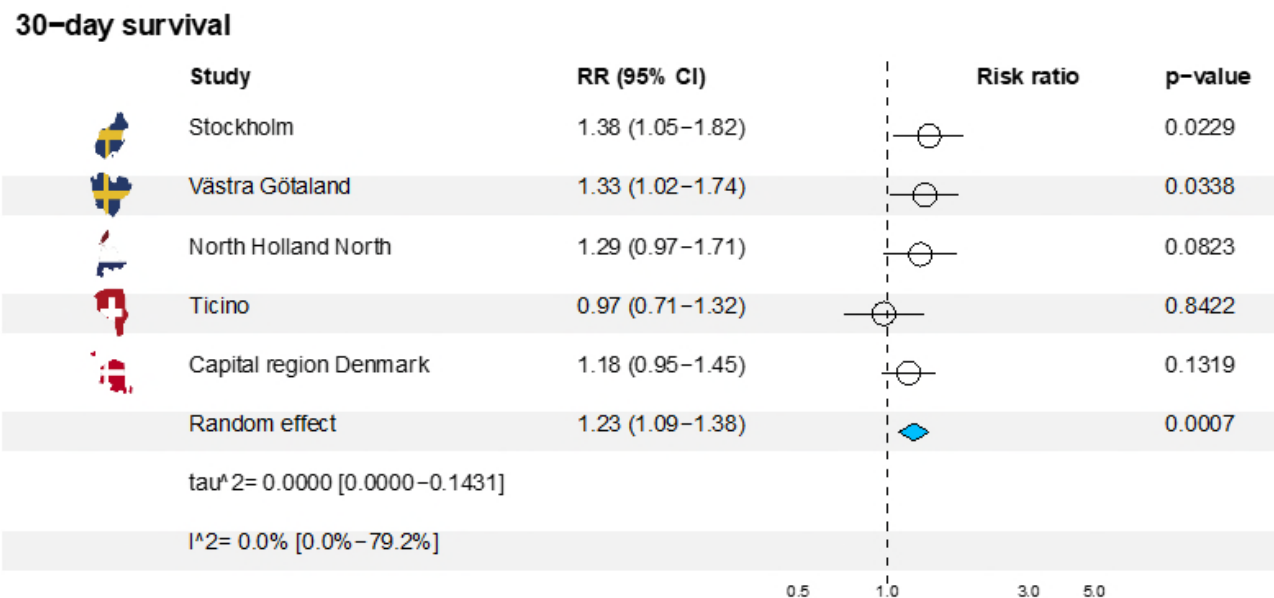
- It is possible to recruit and dispatch volunteers through a smartphone app, and their arrival before EMS was associated with increased odds for bystander CPR and bystander defibrillation
- Activation of volunteer responder was associated with a low risk of physical injury and psychological distress. The risk of injury was well captured through a survey, and no unreported injuries were found when following up on volunteer responders who did not answer the survey
- Our findings support the ERC and AHA 2020/2021 guidelines of volunteer responder activation for OHCA resuscitation
- Further research is needed to investigate the effect of volunteer responder activation on survival for patients with OHCA

Randomized trials in Sweden, Denmark and North America

ESCAPE-NET study

Results (30-day survival)

The pooled estimate for 30-day survival was 1.23 (95% CI=1.09-1.38)



Thank you!

Questions?