



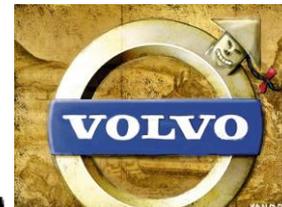
EURECA: MONITORING RESUSCITATION PRACTICE IN EUROPE

LEO BOSSAERT

UNIVERSITY of ANTWERP
EUROPEAN RESUSCITATION COUNCIL
EuReCa STEERING COMMITTEE



No C.o.I.



EUROPE CARES ABOUT HEART DISEASE



european
heart health
charter



- *Each year, CVD kills over 4.35 million people in the 53 member states of the World Health Organization European Region and more than 1.9 million in the European Union (EU).*
- *It is responsible for 55% of all deaths in women across Europe and 43% of the deaths in men, killing more people than all cancers combined.*
- *The cost of CVD on the EU economy is estimated to be approximately 169 billion euros a year.”*



fighting heart disease
and stroke
european heart network

MEP HEART GROUP



FOCUS ON PREVENTION

**OBESITY
STOP SMOKING
HYPERTENSION**

**PREVENTION FAILS FOR 1000 EUROPEAN
CITIZENS PER DAY BECAUSE OF
CARDIAC ARREST**

"For the hearts of our children
I adopt the European Heart Health Charter"

Please visit www.heartcharter.eu



with the support of



CARDIAC ARREST

if we want to cure, we need to know more

- **INPUT, PROCESS, OUTPUT**



- **DEFINITIONS**

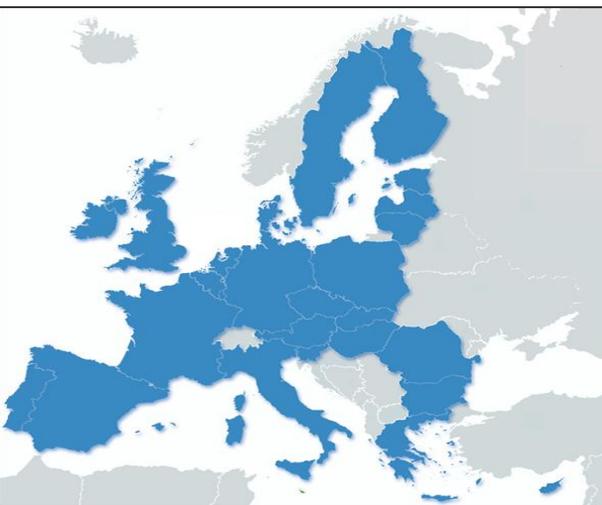
- CAUSE
- BYSTANDER
- AED USE
- TIME

- **NUMERATOR AND DENOMINATOR**

- POPULATION SERVED
- CARDIAC ARREST IN THE COMMUNITY
- OUT - IN HOSPITAL
- AGE LIMITS
- ALL OOHCA
- OOHCA WITH ATTEMPTED RESUSCITATION
- ATTENDED BY EMS
- OOHCA EMS CARDIAC
- OOHCA EMS CARDIAC VF

CARDIAC ARREST IN EUROPE: *the denominator*

- Europe according to EU 27 countries 499 mil
- Political definition (CE-WHO) 47 (53?) countries 830 mil
- Geographical definition 47 (53?) countries 730 mil



CARDIAC ARREST IN EUROPE

what do we know ?



Figure 1.1a Deaths by cause, men, latest available year, Europe

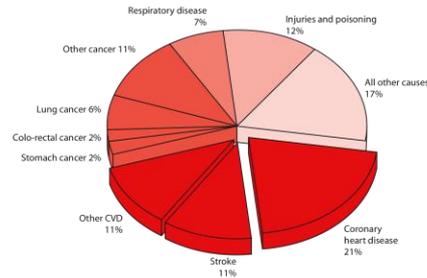


Figure 1.1b Deaths by cause, women, latest available year, Europe

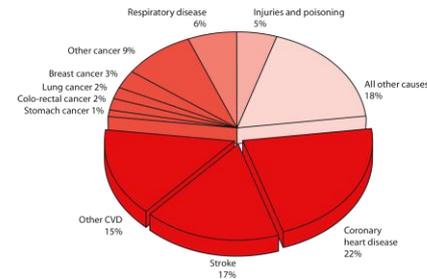


Figure 1.4a Age-standardized death rates from CHD, men aged 0 to 64, latest available year

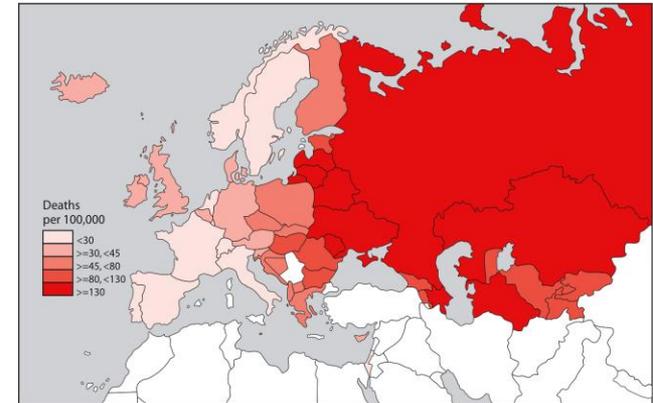


Figure 1.4b Age-standardized death rates from CHD, women aged 0 to 64, latest available year

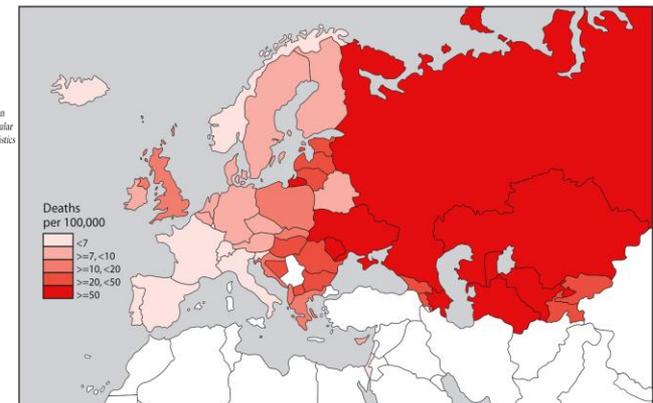


Figure 1.4c Death rates from CHD, men aged under 65, 1972 to 2005, selected countries

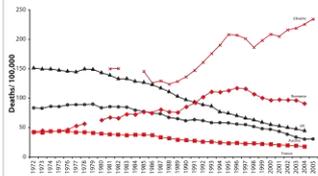


Figure 1.4d Death rates from CHD, women aged under 65, 1972 to 2005, selected countries



Muller-Nordhorn, J. et al.
 Eur Heart J 2008 29:1316-1326
 Widimsky P et al.
 Eur Heart J 2010;31:943-57

EFFECTIVENESS OF DEFIBRILLATOR-CAPABLE EMS FOR VICTIMS OF OUT-OF-HOSPITAL CARDIAC ARREST.

G Nichol et al. Ann Emerg Med 1999;34:517

Metaanalysis

Overall Incidence *0.5-1/1000/year*
Overall Survival *6.4 % (0-10)*

Cardiac Arrest VF/VT, witnessed, cardiac (=1/3)

ROSC	<i>30-50%</i>
discharged alive	<i>25% (12-52%)</i>

INCIDENCE OF CARDIAC ARREST IN USA.

T Rea, M Eisenberg, G Sinibaldi, R White. Resuscitation 2004;63:17-24

35 reports 1980-2003

	incidence	survival
All rhythm	<i>0.5/1000/y</i>	<i>8.4%</i>
VF	<i>0.2/1000/y</i>	<i>17.7%</i>

Extrapolation: USA (290 million)

All rhythm	<i>155.000/y</i>
VF	<i>60.000/y</i>

INCIDENCE OF CARDIAC ARREST IN EUROPE.

C Atwood, M Eisenberg, J Herlitz, T Rea. Resuscitation 2005;67:75-80

32 reports 1980-2004

All rhythm
VF

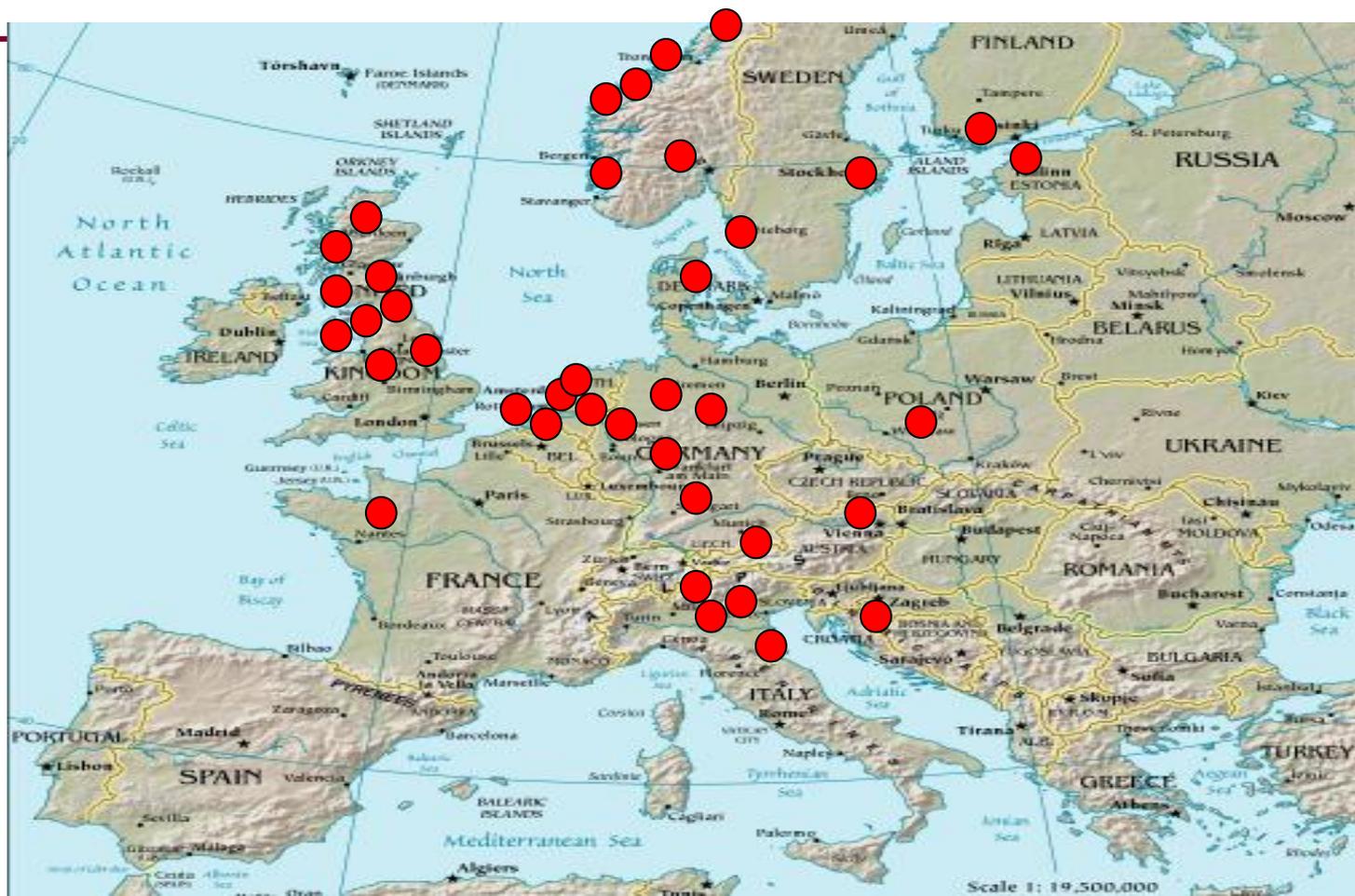
incidence
0.4/1000/y
0.2/1000/y

survival
10.7%
21.2%

Extrapolation: Europe (729 million)

All rhythm
VF

275.000/y
123.000/y

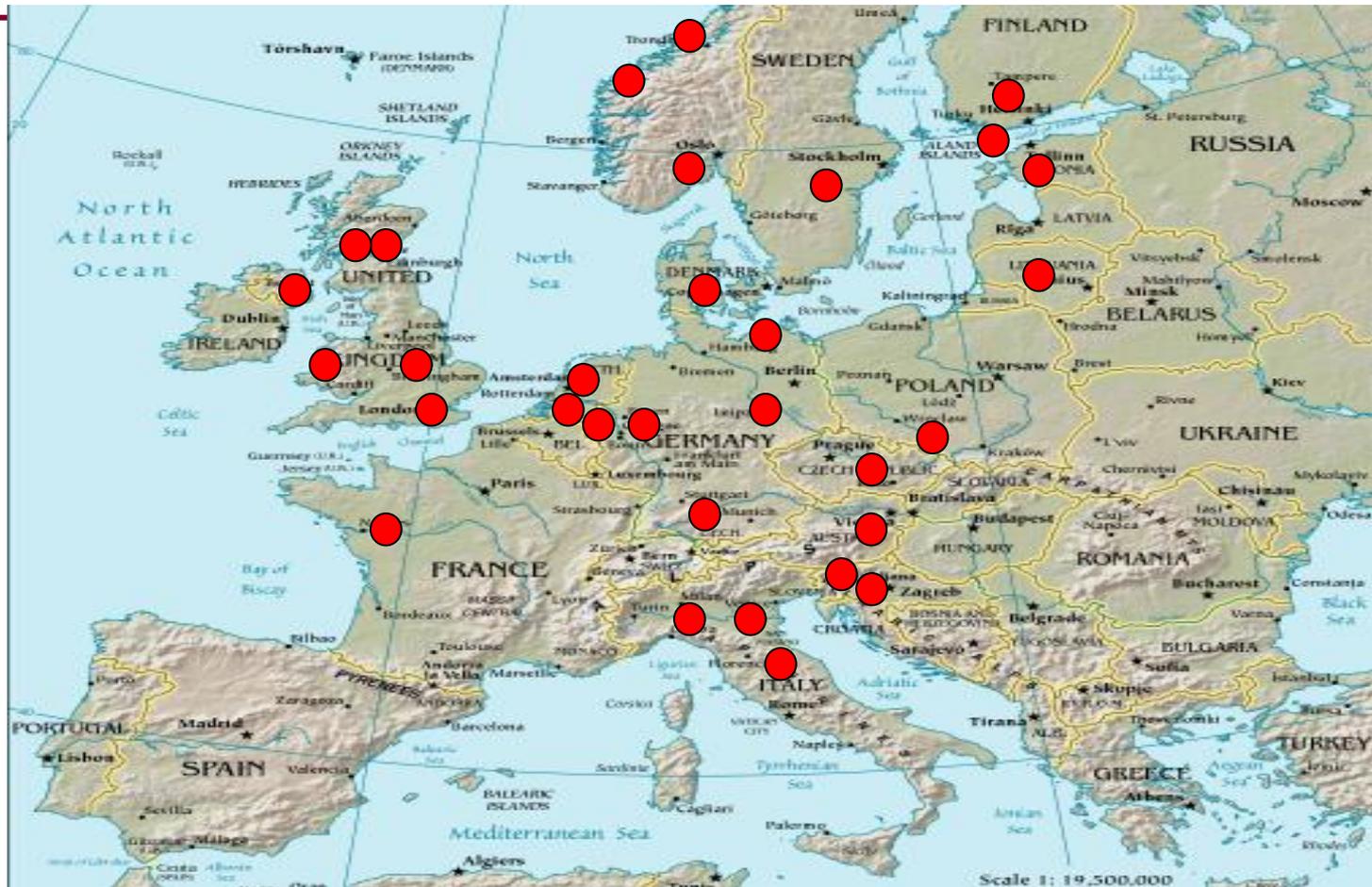


GLOBAL INCIDENCES OF OoHCA AND SURVIVAL RATES.

J Berdowski, R Berg, J Tijssen, R Koster. Resuscitation 2010, in press

31 reports 1988-2007

	incidence	survival
EMS attended OoHCA	0.86/1000/y	9 (6-31)%
EMS attended OHCA cardiac	0.35/1000/Y	
EMS attended OoHCA cardiac VF	0.13/1000/y	8-43%



THE PROCESS: 5 EUROPEAN REGIONS



Resuscitation in Europe: a tale of five European regions

Johan Herlitz ^{a,*}, Jan Bahr ^b, Matthias Fischer ^c, Markku Kuisma ^d, Kristian Lexow ^e, Gestur Thorgeirsson ^f

^a Division of Cardiology, Sahlgrenska University Hospital, S-413 45 Göteborg, Sweden

^b Zentrum Anaesthesiologie, Rettungs- und Intensivmedizin, Georg-August-Universität Göttingen, Robert-Koch-Str. 40, D-37075 Göttingen, Germany

^c Clinic of Anaesthesiology and Intensive Care Medicine, University of Bonn, Sigmund-Freud Strasse 25, D-53105 Bonn, Germany

^d Helsinki City EMS, Agricolaankatu 15 A, FIN-00530 Helsinki, Finland

^e Anestesiavd., Sentralkjokhuset i Rogaland, POB 8100, N-4003 Stavanger, Norway

^f Department of Medicine, Reykjavik Hospital, Fossvogi, 108 Reykjavik, Iceland

	<i>survival overall (%)</i>	<i>survival cardiac, VF, witnessed</i>
Stavanger	23	55
Mainz	19	40
Göttingen	18	42
Helsinki	17	32
Reykjavik	16	27
Bonn	15	32
Copenhagen	13	20
Göteborg	12	29
Madrid	12	22
Oslo	8	21
Antwerp	11	23
Amsterdam	11	15
Berlin	9	16
Brugge	8	20
Udine	8	15
Ljubljana	6	13

J Herlitz, et al
Resuscitation in Europe:
a tale of five European regions.
Resuscitation 1999;41:121-31

	<i>survival cardiac, VF, witnessed</i>	<i>% bystander CPR</i>	<i>% patients in VF</i>	<i>time call-arrival</i>
Stavanger	55	67	61	6
Göttingen	42	34	46	7
Helsinki	32	27	65	7
Reykjavik	27	46	59	5
Bonn	32	28	53	5

THE PROCESS: *ROC EPISTRY*



Rationale, development and implementation of the Resuscitation Outcomes Consortium ROC Epistry—Cardiac Arrest

L Morrison, et al, Resuscitation 2008

- Prospective population based registry
- Support for RCTs in OoHCA and trauma
- All EMS-attended 911 calls for OoHCA
- Data set: mandatory and optional (Utstein, NEMESIS)
- Definitions adjusted to current literature

- Capacity: 9000-13500 cardiac arrests

THE PROCESS: NRCPR REGISTRY

JAMA[®]

Online article and related content
current as of August 21, 2010.

First Documented Rhythm and Clinical Outcome From
In-Hospital Cardiac Arrest Among Children and Adults

Vinay M. Nadkarni; Gregory Luke Larkin; Mary Ann Peberdy; et al.

JAMA. 2006;295(1):50-57 (doi:10.1001/jama.295.1.50)

First Documented Rhythm and Clinical Outcome from In-hospital Cardiac Arrest Among Children and Adults

V Nadkarni et al. JAMA 2006; 295:50-57

253 hospitals USA-CDN
2000-2005
36902 adults and 880 children

	adults	child
survival to discharge	18%	27%
good CPC	73%	65%
VF/VT	23%	14%
asystole	35%	40%

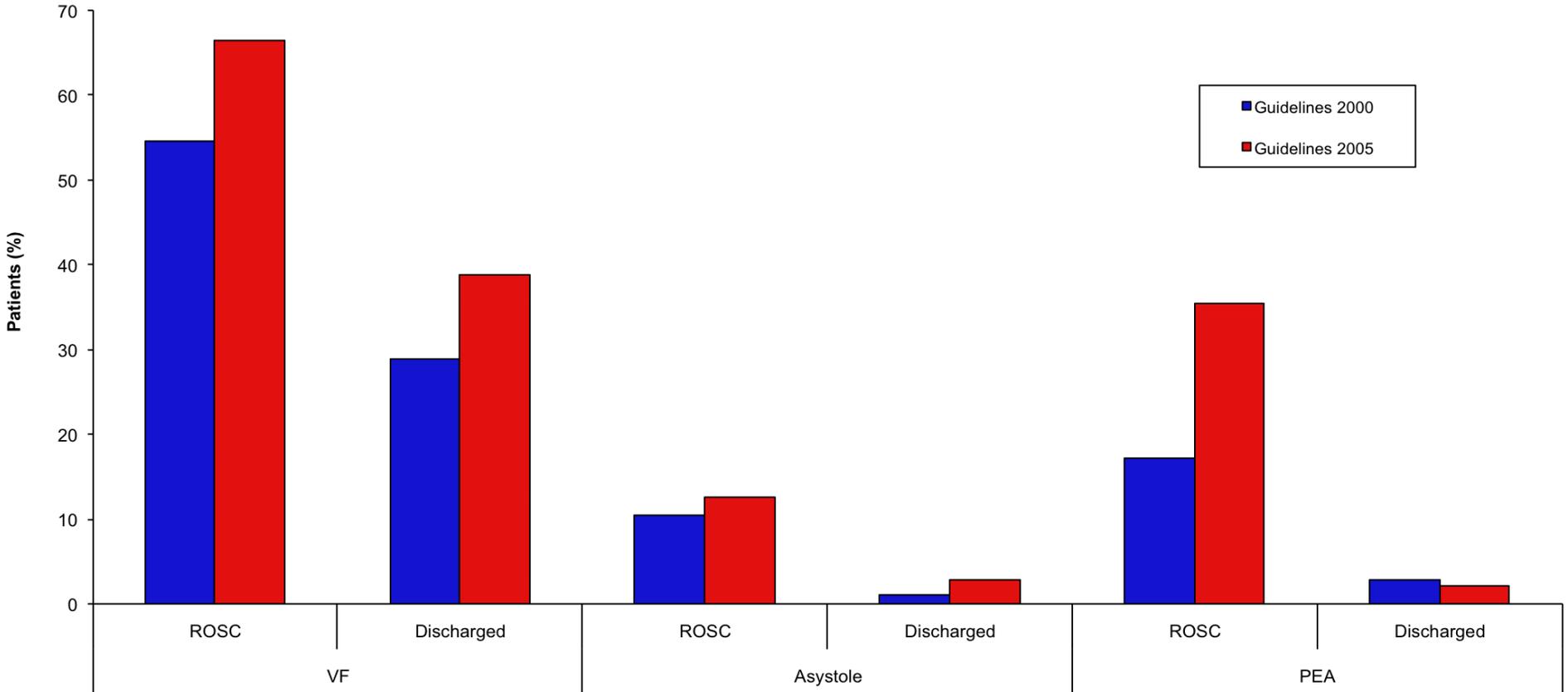
INCIDENCE: 0.175/bed/year
1-5/1000 admissions/year

THE PROCESS: IMPACT OF GUIDELINES

Improved survival after an out-of-hospital cardiac arrest using new guidelines

J. STEINMETZ, S. BARNUNG, S. L. NIELSEN, M. RISOM and L. S. RASMUSSEN
Department of Anaesthesia, Centre of Head and Orthopaedics, Copenhagen University Hospital, Rigshospitalet, Copenhagen, Denmark.

Out-of-hospital cardiac arrests with cardiac etiology





European
Resuscitation
Council

EUropean REgistry of CArdiac Arrest

*many local-regional-national registries
but no European overview*

STEERING COMMITTEE



CONSORTIUM



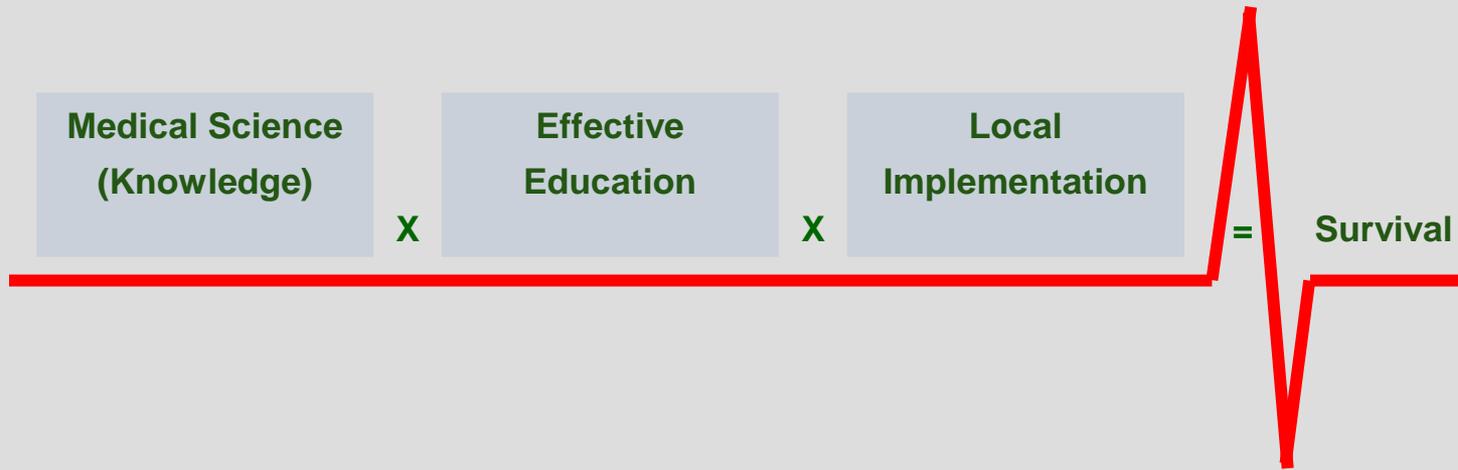
ERC EXECUTIVE COMMITTEE 07 12 2007

“... a European Cardiac Arrest Registry should be in place within two years from now.

It was proposed to name the registry “EuReCa” (European Register of Cardiac Arrest). “

EURECA : OBJECTIVES

The formula of Survival



Chain of survival



- **UNDERSTAND, COMPARE, LEARN**
- **MONITOR GUIDELINES**
- **IMPROVE QUALITY**

EuReCa: OBJECTIVES

- registry of cardiac arrest
 - EMS-based
 - out of hospital and in hospital
 - improve quality CoS: feedback, benchmark
 - support research
 - uniform definitions (Utstein)
 - quality before quantity
 - tool for all: registration & analysis
-
- web supported
 - compliant with law on privacy
 - sustainable: budget, organisation
 - learn from existing experiences

EuReCa: methods

Utstein updated

- *system variables*
 - population served
 - EMS system
 - dispatch CPR
- *patient variables*
 - CA confirmed
 - CPR attempted
 - aetiology
 - place
- *process variables*
 - witnessed
 - bystander CPR
 - rhythm
 - AED use
 - EMS intervention
 - time: call-arrival-ECG-shock-ED
- *outcome variables*
 - ROSC
 - admission hospital
 - discharge-death

EuReCa:

lessons from data collected in 5 test regions

(Belgium, Germany, Netherlands, Spain, Sweden)

	REGION 1 <i>E</i>	REGION 2 <i>N</i>	REGION 3 <i>G</i>	REGION 4 <i>B</i>	REGION 5 <i>S</i>
Population served (total country)	5.600.000 (45.800.000)	2.400.000 (16.500.000)	4.500.000 (82.000.000)	10.700.000 (10.700.000)	6.300.000 (9.300.000)
CPR records in the registry (N)	955	1.116	1.882	5.671	2.822
Witnessed %	62 %	78 %	67%	NA	68%
Bystander CPR %	12 %	61 %	15 %	NA	59 %
AED before EMS %	8 %	12 %	2 %	11 %	17 %
Any ROSC %	28 %	45 %	43 %	NA	26 %
Admission to hospital %	25 %	41 %	33 %	39 %	24 %
Discharge from hospital %	NA	25 %	29%	NA	NA
Alive at 30 days %	NA	19 %	11 %	NA	7 %

EuReCa: some key data from 5 test regions

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UNDERSTAND THE DATA

- **INCLUSION**
- **DEFINITION**
- **COMPLETE-ACCURATE**
- **REAL DIFFERENCE**

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UNDERSTAND THE DATA

- **INCLUSION**
- **DEFINITION**
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- **REAL DIFFERENCE**

CONCLUSIONS

- **POOR OUTCOME AFTER CARDIAC ARREST, BUT EXAMPLES OF EXCELLENT PRACTICE**
- **IMPROVING OUTCOME REQUIRES BETTER KNOWLEDGE OF CA**
 - *PATIENT&SYSTEM, PROCESS, OUTCOME*
 - *GUESS AND MISS, MEASURE AND KNOW*
 - *NUMERATOR & DENOMINATOR*
 - *DEFINITIONS*
 - *QUALITY*
 - *OBSTACLES*
 - *REAL DIFFERENCES*
- **BENCHMARKING**
 - *KNOW OWN SITUATION*
 - *LEARN FROM THE BEST*



The 2010 ERC Guidelines Congress

Resuscitation 18 October 2010 www.erc.edu



RESUSCITATION
DECEMBER 2-4 2010
PORTO PORTUGAL

www.resuscitation2010.eu



The Guidelines Congress

10TH SCIENTIFIC CONGRESS OF THE
EUROPEAN RESUSCITATION COUNCIL



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