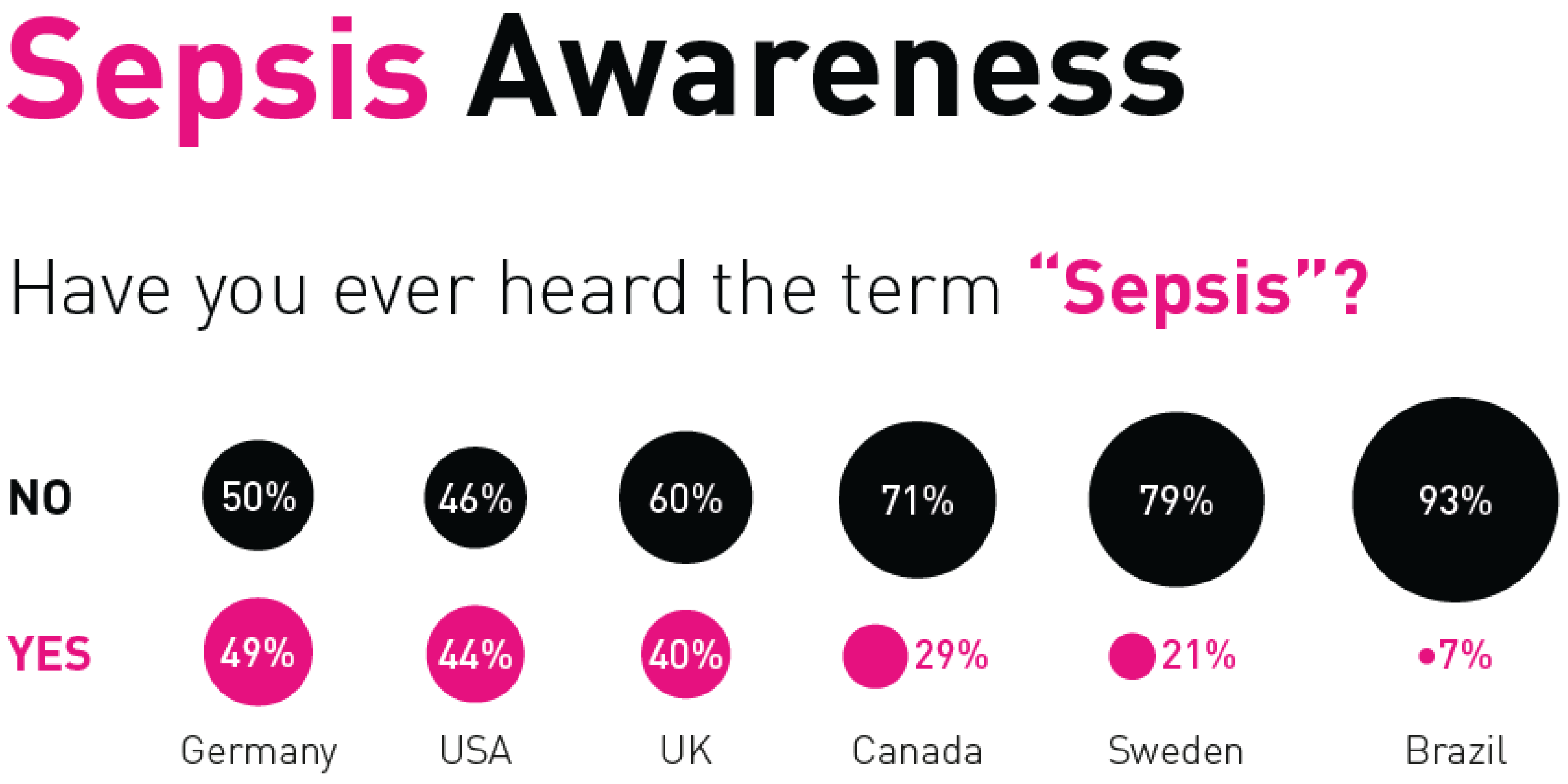
stop
sepsis
save
lives

The special problem of sepsis: how to prevent and to recognize it

K. Reinhart ML
Chairman Global Sepsis Alliance

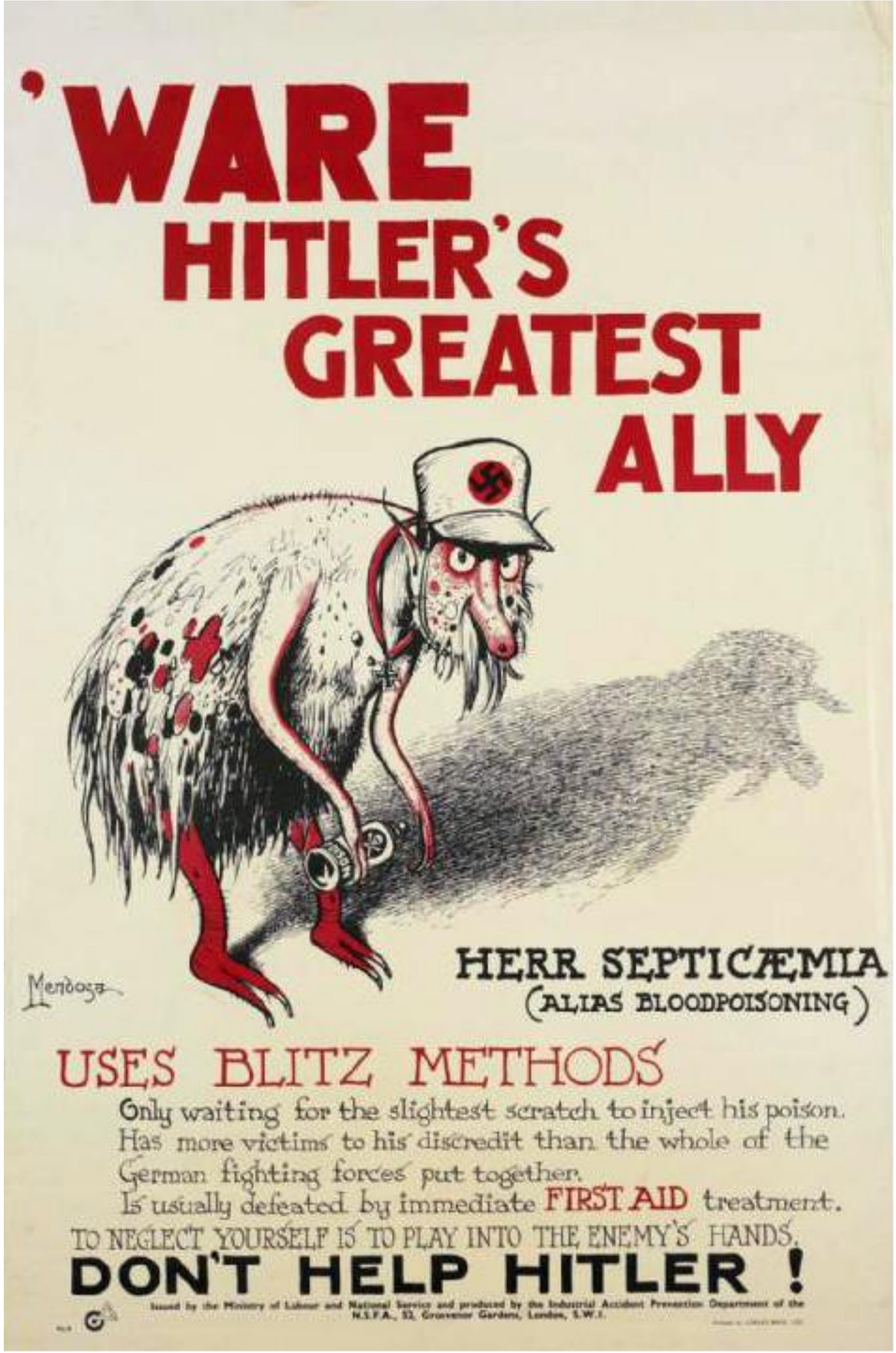
stop
sepsis
save
lives

The majority of poeple have not heard the term sepsis in 2013



Sepsis Awareness

Have you ever heard the term "Sepsis"?



'WARE HITLER'S GREATEST ALLY

HERR SEPTICÆMIA
(ALIAS BLOODPOISONING)

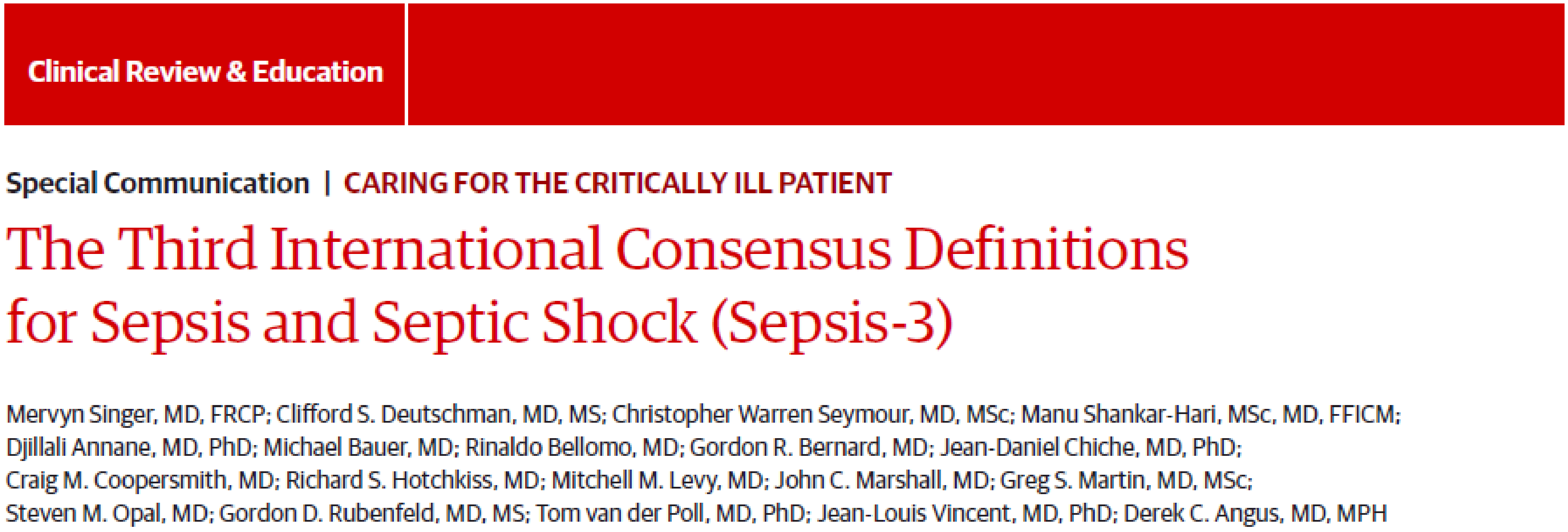
USES BLITZ METHODS

Only waiting for the slightest scratch to inject his poison.
Has more victims to his discredit than the whole of the German fighting forces put together.
Is usually defeated by immediate FIRST AID treatment.

TO NEGLECT YOURSELF IS TO PLAY INTO THE ENEMY'S HANDS.

DON'T HELP HITLER !

Issued by the Ministry of Labour and National Service and produced by the Industrial Accident Prevention Department of the N.S.F.A., 52, Grosvenor Gardens, London, S.W.1.



Clinical Review & Education

Special Communication | CARING FOR THE CRITICALLY ILL PATIENT

The Third International Consensus Definitions for Sepsis and Septic Shock (Sepsis-3)

Mervyn Singer, MD, FRCP; Clifford S. Deutschman, MD, MS; Christopher Warren Seymour, MD, MSc; Manu Shankar-Hari, MSc, MD, FFICM; Djillali Annane, MD, PhD; Michael Bauer, MD; Rinaldo Bellomo, MD; Gordon R. Bernard, MD; Jean-Daniel Chiche, MD, PhD; Craig M. Coopersmith, MD; Richard S. Hotchkiss, MD; Mitchell M. Levy, MD; John C. Marshall, MD; Greg S. Martin, MD, MSc; Steven M. Opal, MD; Gordon D. Rubenfeld, MD, MS; Tom van der Poll, MD, PhD; Jean-Louis Vincent, MD, PhD; Derek C. Angus, MD, MPH

“Sepsis is the primary cause of death from infection,especially if not recognized and treated promptly.Its recognition mandates urgent attention.“

stop
sepsis
save
lives

It must become common knowledge that

Sepsis can be **prevented** by **vaccination** and **clean care**

GLOBAL SEPSIS ALLIANCE

Vaccination must also become standard for the adult at risk population

- Elderly above age 60
- Healthcare pe
- Pr
- ised
-
- C ung, heart, liver and renal disease
- Chronic alcoholism

Vaccination of 85,000 adults ≥65 years, in the Netherlands reduced Invasive Pneumococcal Disease/Sepsis and Pneumococcal Pneumonia by 75% and 45% respectively

M. Bonten et al NEJM, 2015

Report by the National Confidential Enquiry into Patient Outcome and Death – 2015 in UK

Just Say Sepsis!

A review of the process of care rece
by patients with sepsis

Sepsis is important because it is a major cause of avoidable death in our hospitals.

Between 20-50 percent of patients admitted to hospitals in the UK are diagnosed and treated too late

stop
sepsis
save
lives

Just Say Sepsis!

A review of the process of care received by patients with sepsis

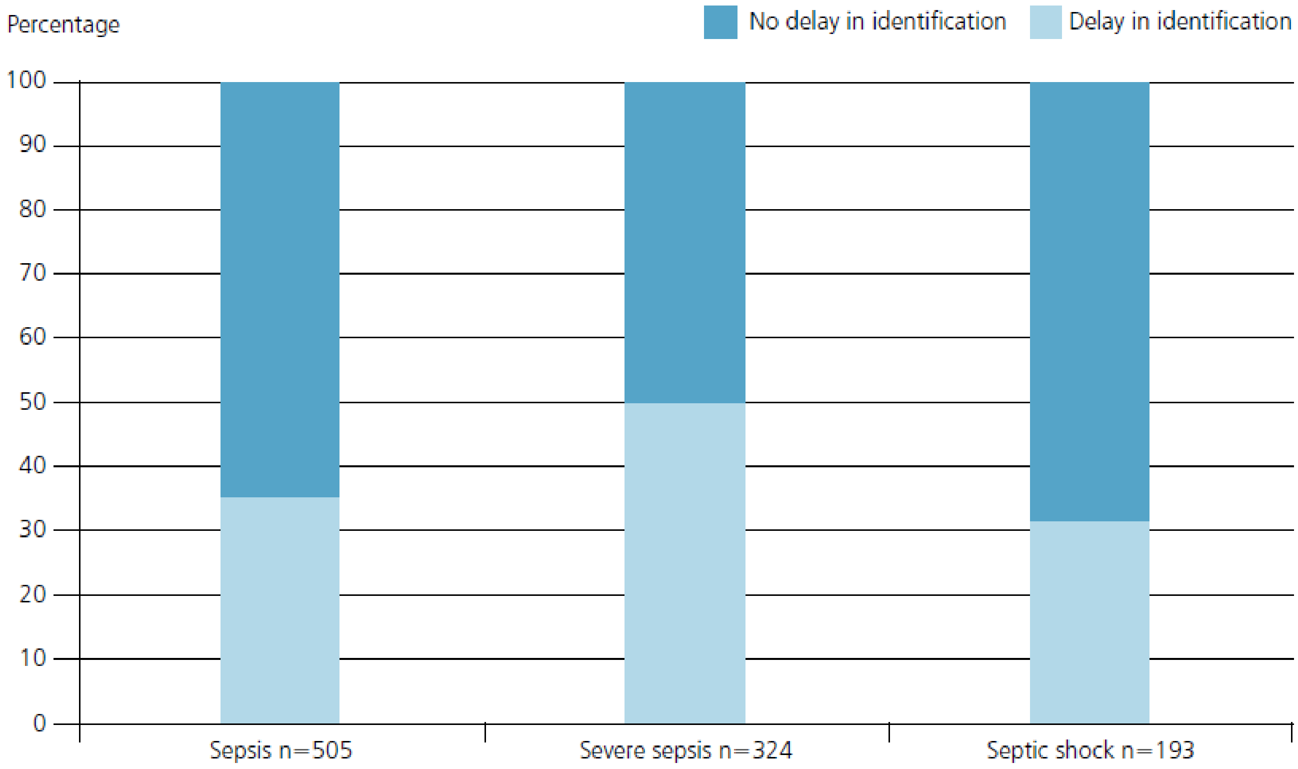


Figure 6.1 Delay in identifying sepsis, severe sepsis and septic shock – Reviewers' opinion

September 13 | World Sepsis

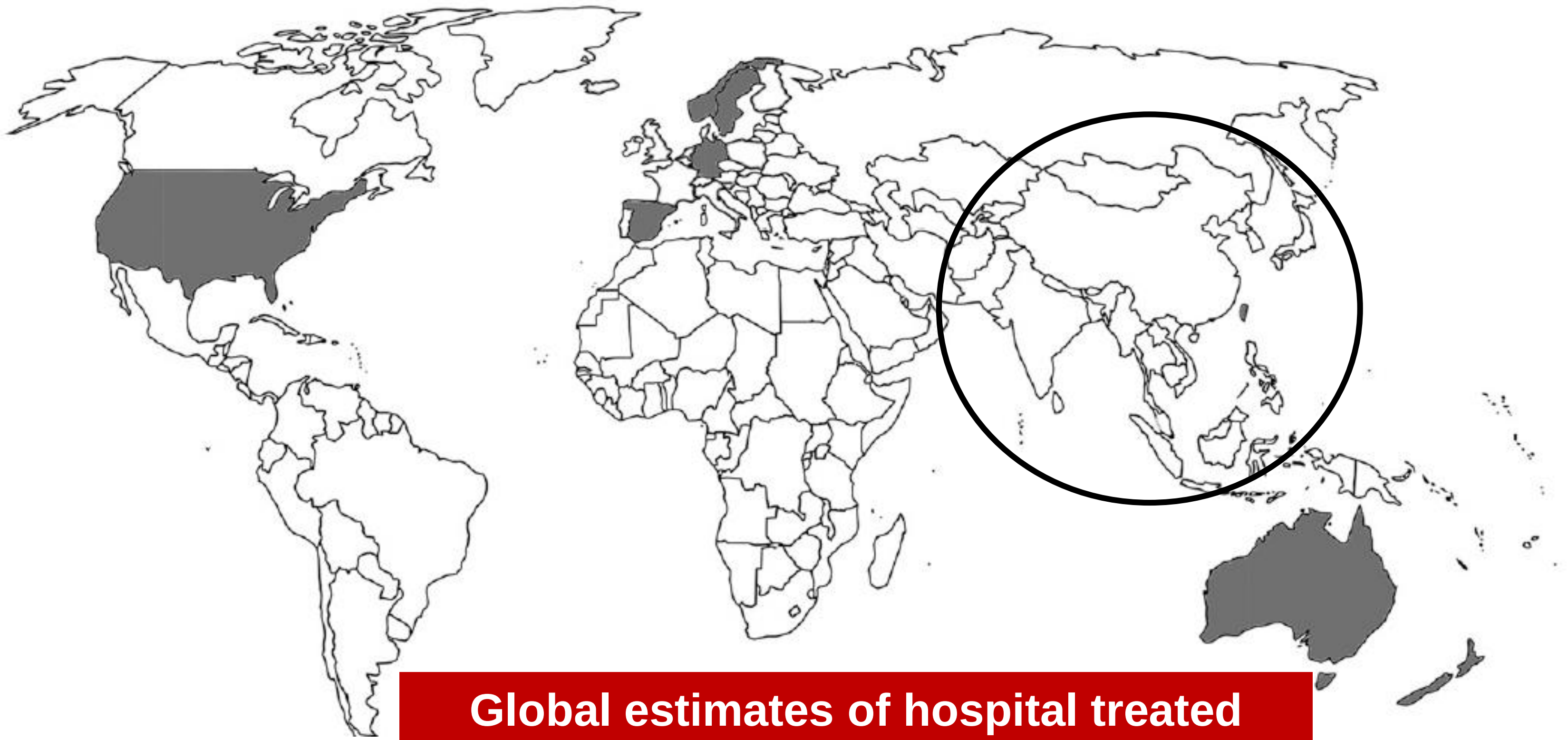
National Confidential Enquiry into Patient Outcome and Death (2015)

ORIGINAL ARTICLE

Assessment of Global Incidence and Mortality of Hospital-treated Sepsis

Current Estimates and Limitations

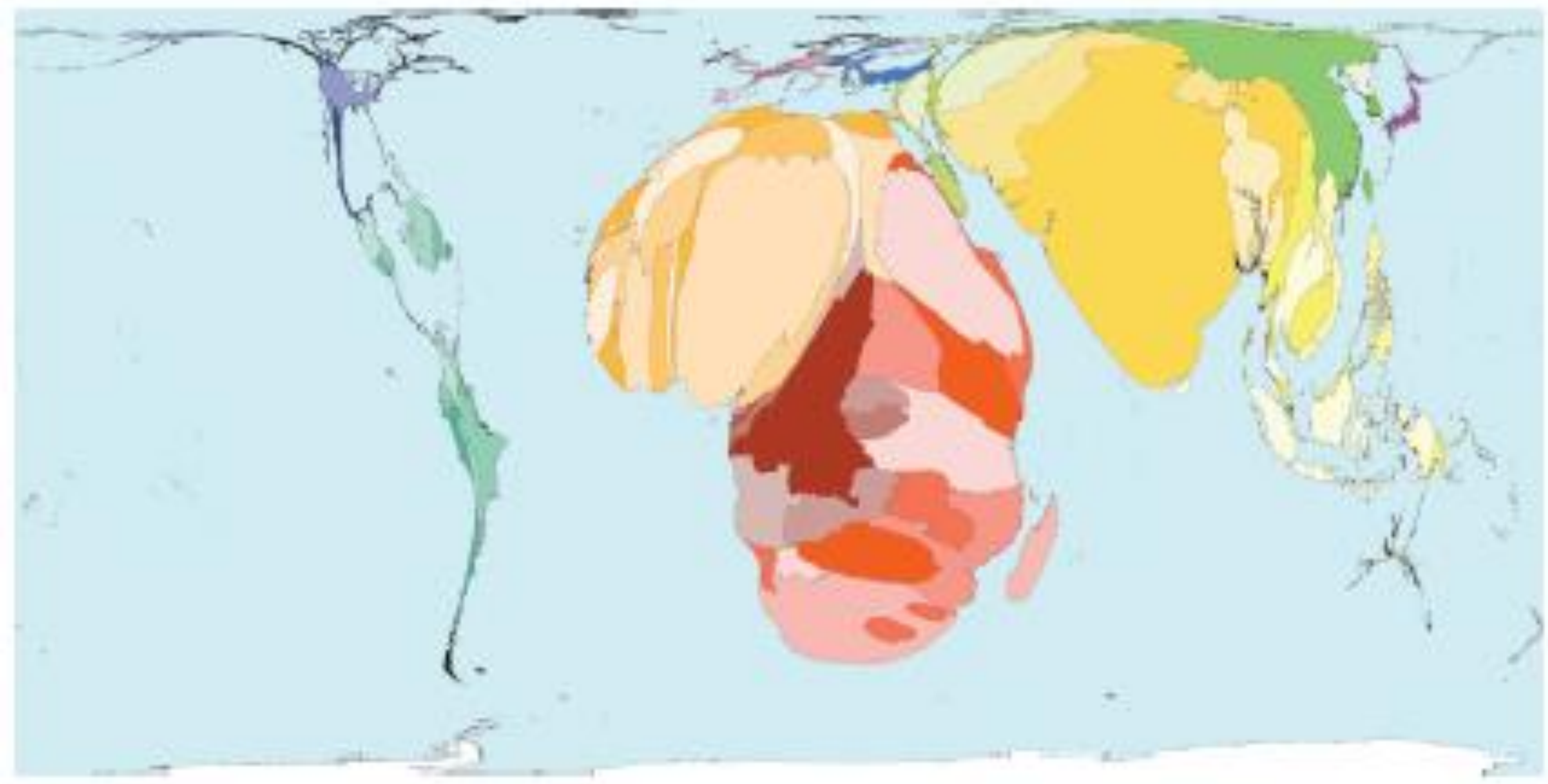
Carolin Fleischmann[1,2], André Scherag[3], Neill K. J. Adhikari[4], Christiane S. Hartog[1,2], Thomas Tsaganos[5], Peter Schlattmann[6], Derek C. Angus[7*], and Konrad Reinhart[1,2*]; on behalf of the International Forum of Acute Care Trialists



Global estimates of hospital treated sepsis cases/year 30.7 million

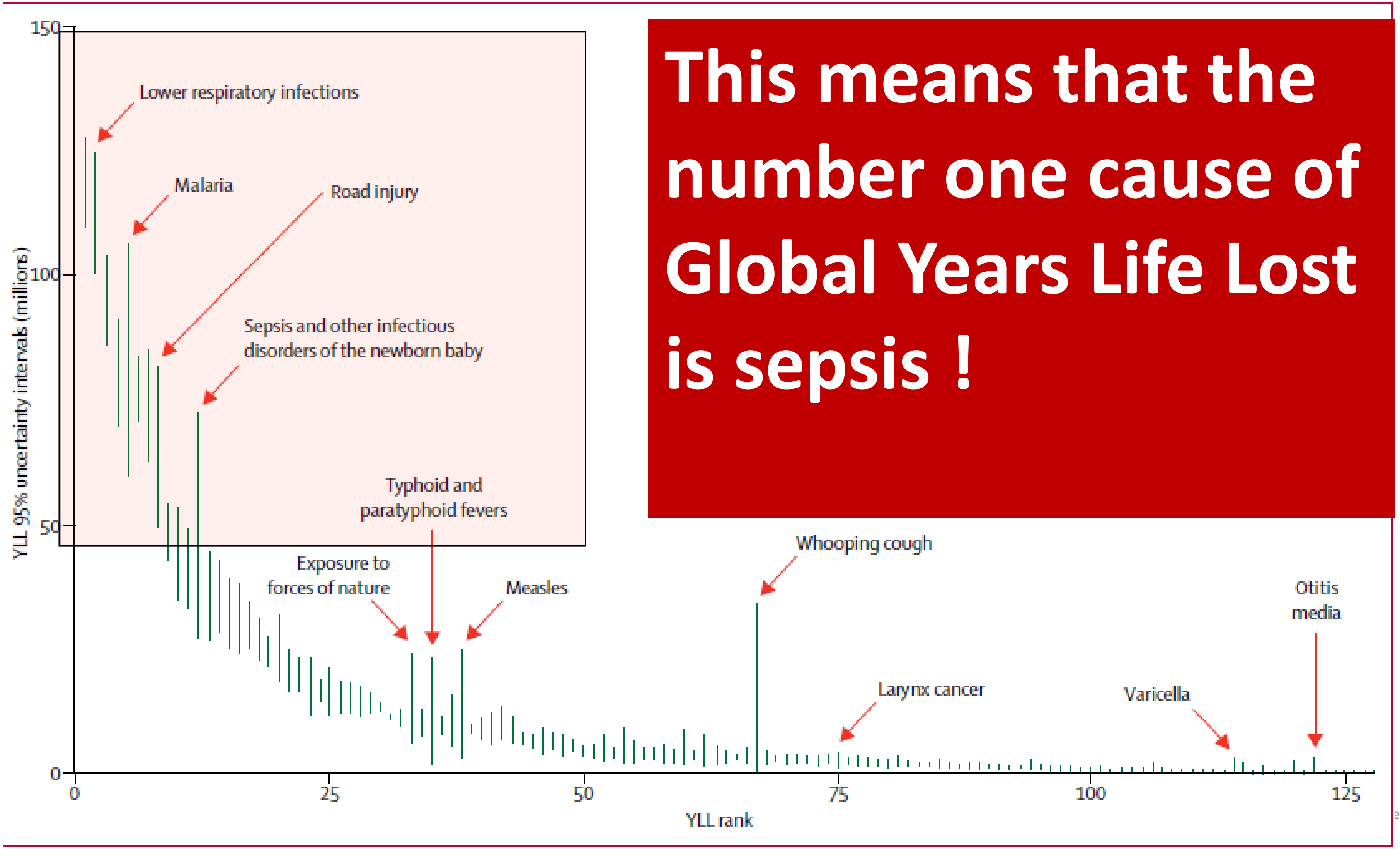
American Journal of Respiratory and Critical Care Medicine Volume 193 Number 3 | February 1 2016

Global Deaths from Infectious Diseases mostly occur in ressource poor countries



www.world-mapper.org

Lower respiratory tract infections are the number one cause of Global Years of Life Lost:



This means that the number one cause of Global Years Life Lost is sepsis !

Lozano R et al Global and Regional Mortality…, Lancet 2012

Deutsches Ärzteblatt 10

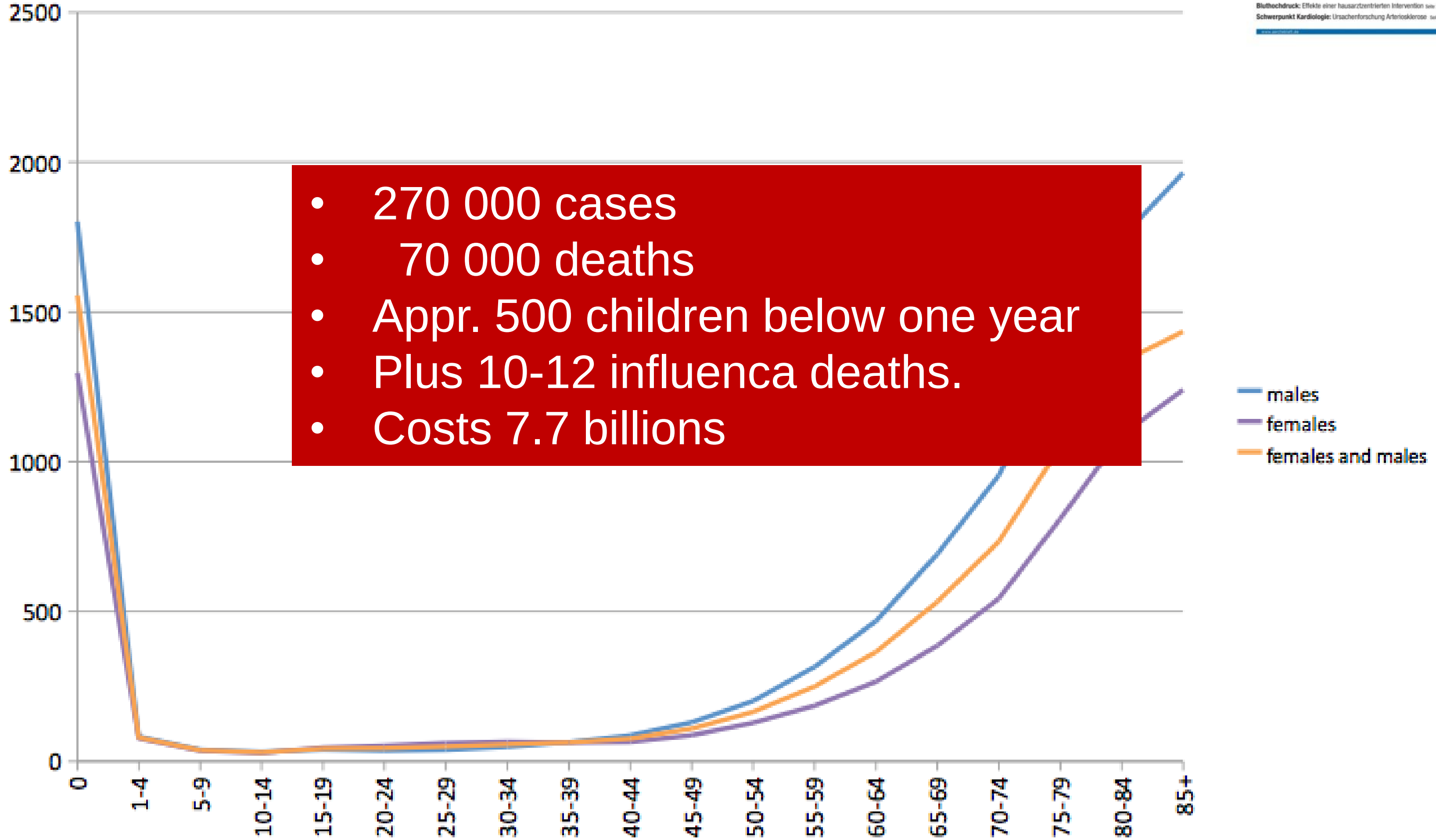
SEPSIS

Fallzahlen und Sterblichkeit

Bluthochdruck: Effekte einer hausarztzentrierten Intervention

Schwerpunkt Kardiologie: Ursachenforschung Arteriosklerose

Highest Incidence in Neonates, Newborns and the Elderly



- 270 000 cases
- 70 000 deaths
- Appr. 500 children below one year
- Plus 10-12 influenca deaths.
- Costs 7.7 billions

World
Sepsis
Day

Fleischmann et al DÄB 2016

stop
sepsis
save
lives

Globally sepsis is more common than heart attacks and kills more people than any cancer !

GSA
GLOBAL SEPSIS ALLIANCE

SEPSIS KILLS program:

reduce preventable harm to patients with sepsis

RECOGNISE:

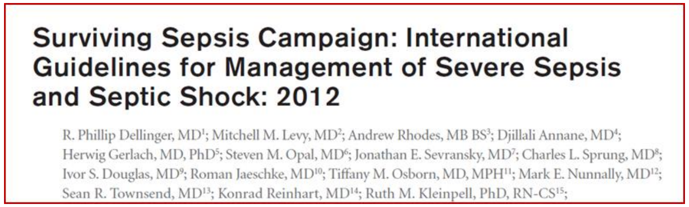
Risk factors, signs and symptoms of sepsis and inform senior clinician

RESUSCITATE:

With rapid antibiotics and IV fluids within one hour

REFER:

To specialist care and initiate retrieval if needed



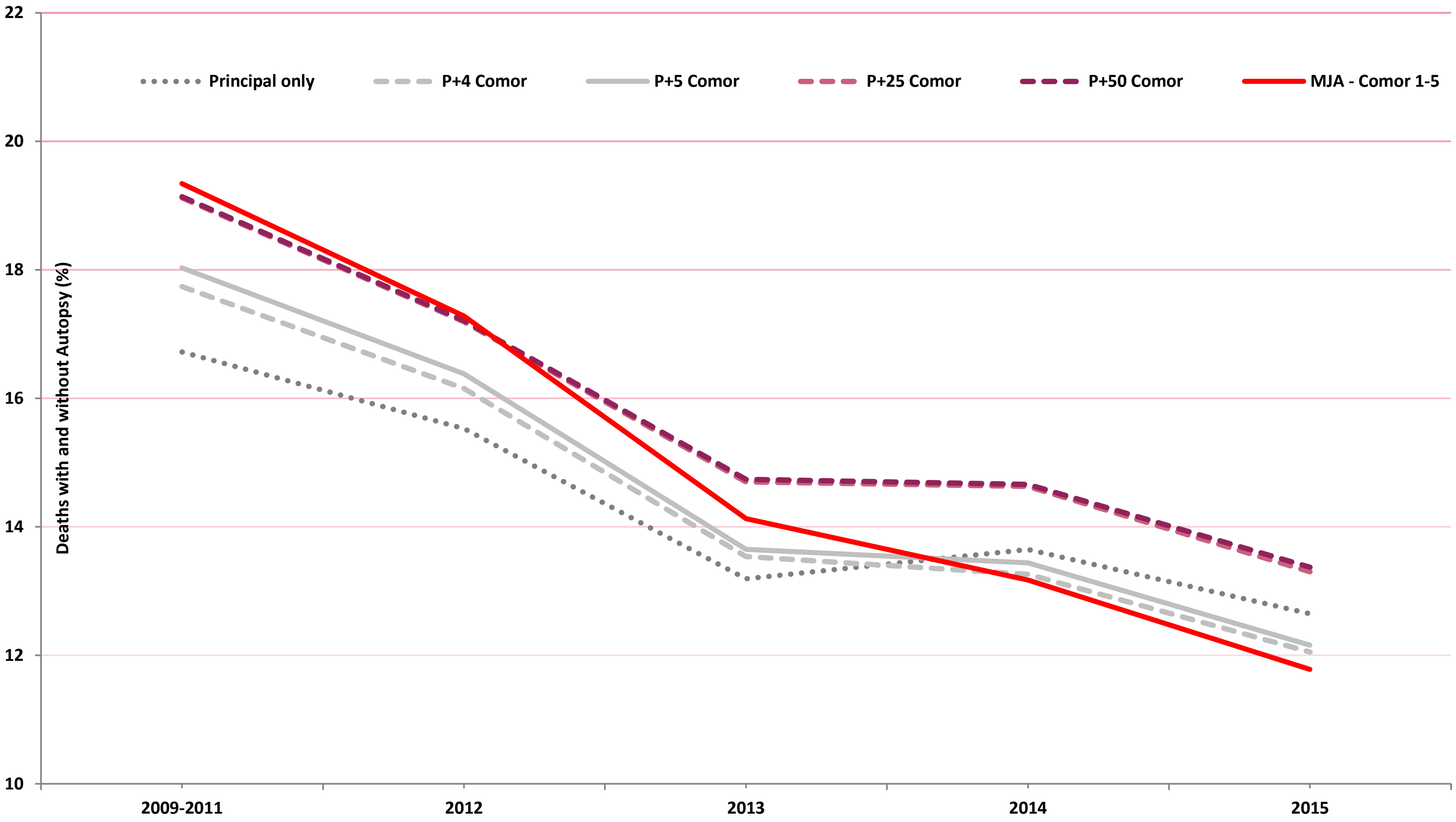
Surviving Sepsis Campaign: International Guidelines for Management of Severe Sepsis and Septic Shock: 2012

R. Phillip Dellinger, MD[1]; Mitchell M. Levy, MD[2]; Andrew Rhodes, MB BS[3]; Djillali Annane, MD[4]; Herwig Gerlach, MD, PhD[5]; Steven M. Opal, MD[6]; Jonathan E. Sevransky, MD[7]; Charles L. Sprung, MD[8]; Ivor S. Douglas, MD[9]; Roman Jaeschke, MD[10]; Tiffany M. Osborn, MD, MPH[11]; Mark E. Nunnally, MD[12]; Sean R. Townsend, MD[13]; Konrad Reinhart, MD[14]; Ruth M. Kleinpell, PhD, RN-CS[15];

Bethesda Hospital

NSW hospital sepsis mortality

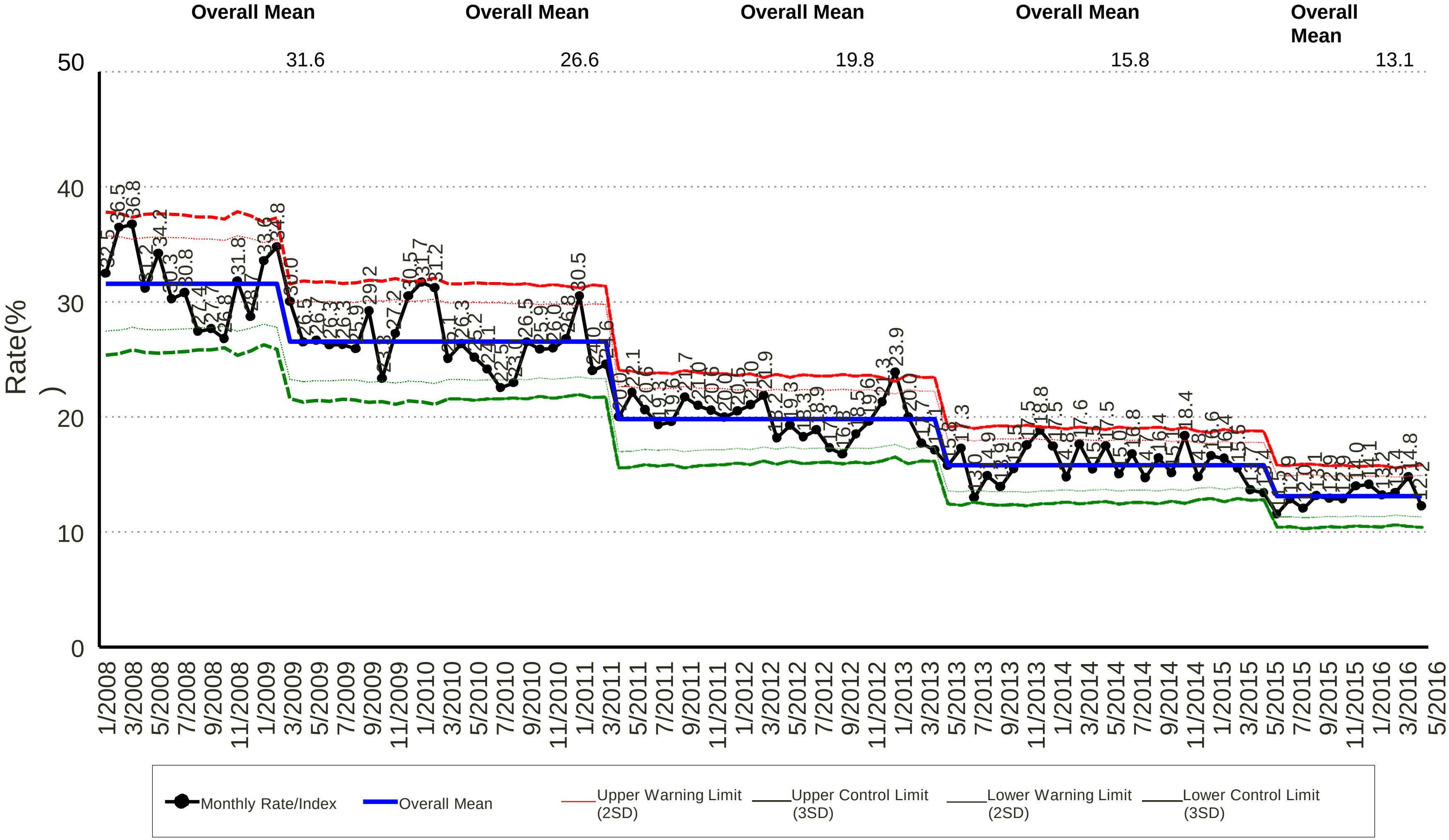
stop
sepsis
save
lives



Northwell Health

Raw Sepsis and Severe Sepsis/Septic Shock Mortality Rate

January 2008 - May 2016



Note: Sepsis and Severe Sepsis/Septic Shock discharges based on the following secondary ICD-9 codes: 99591 (Sepsis). 99592 (Severe Sepsis). 78552 (Septic Shock) is a subset of 99592 and is included in this report. The following ICD-10 codes for Sepsis, Severe Sepsis and Septic Shock are included after September 2015: 'A400','A401','A403','A408','A409','A4101','A4102','A411','A412','A413','A414','A4150','A4151','A4152','A4153','A4159','A4181','A4189','A419','A427','A5486','A021','A227','A267','A327','B377','R6520','R6521'. Excludes patients under 18 years of age.

Data Source: Hospital Billing System

Copyright © 2016, Krasnoff Quality Management Institute

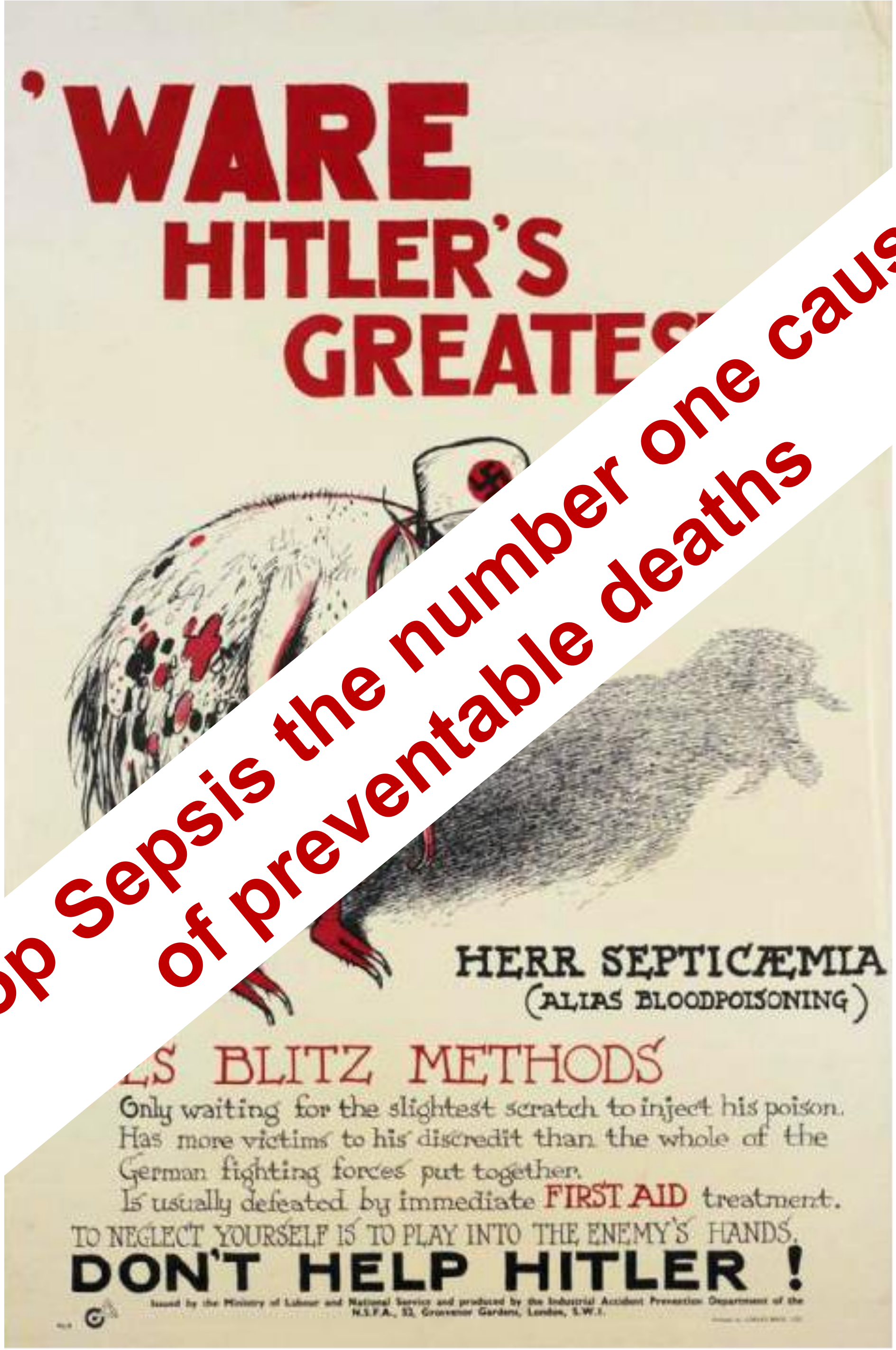
Data as of: August 17, 2016

Development of Sepsis Mortality

- Australia: 2000-2012 from 35% to 18.5%
- England: 2000-2012 from 45.5% to 32.1%
- USA: 2003-2007 from 37 % to 29%
- Germany: 2003-2013 from 47,8% to 43,6%

Necessary Steps to Achieve the Goals of the WHA Resolution on Sepsis

- Foster the collaboration with between the GSA and WHO
- Achieve adequate representation if sepsis in the GBDR
- Encourage national governments for national action plans:
    - Sepsis awareness campaigns
    - Sepsis mortality as quality indicators
    - National reporting of incidence and mortality
    - Promotion of certified facilities for acute and longterm care
    - Support of research for innovative diagnostics and therapeutics



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Stop Sepsis the number one cause of preventable deaths

stop
sepsis
save
lives

CLINICAL FO
FROM REVIEW
INCIDEN
ent of Sepsis

This report identified sepsis as a primary cause of preventable deaths !

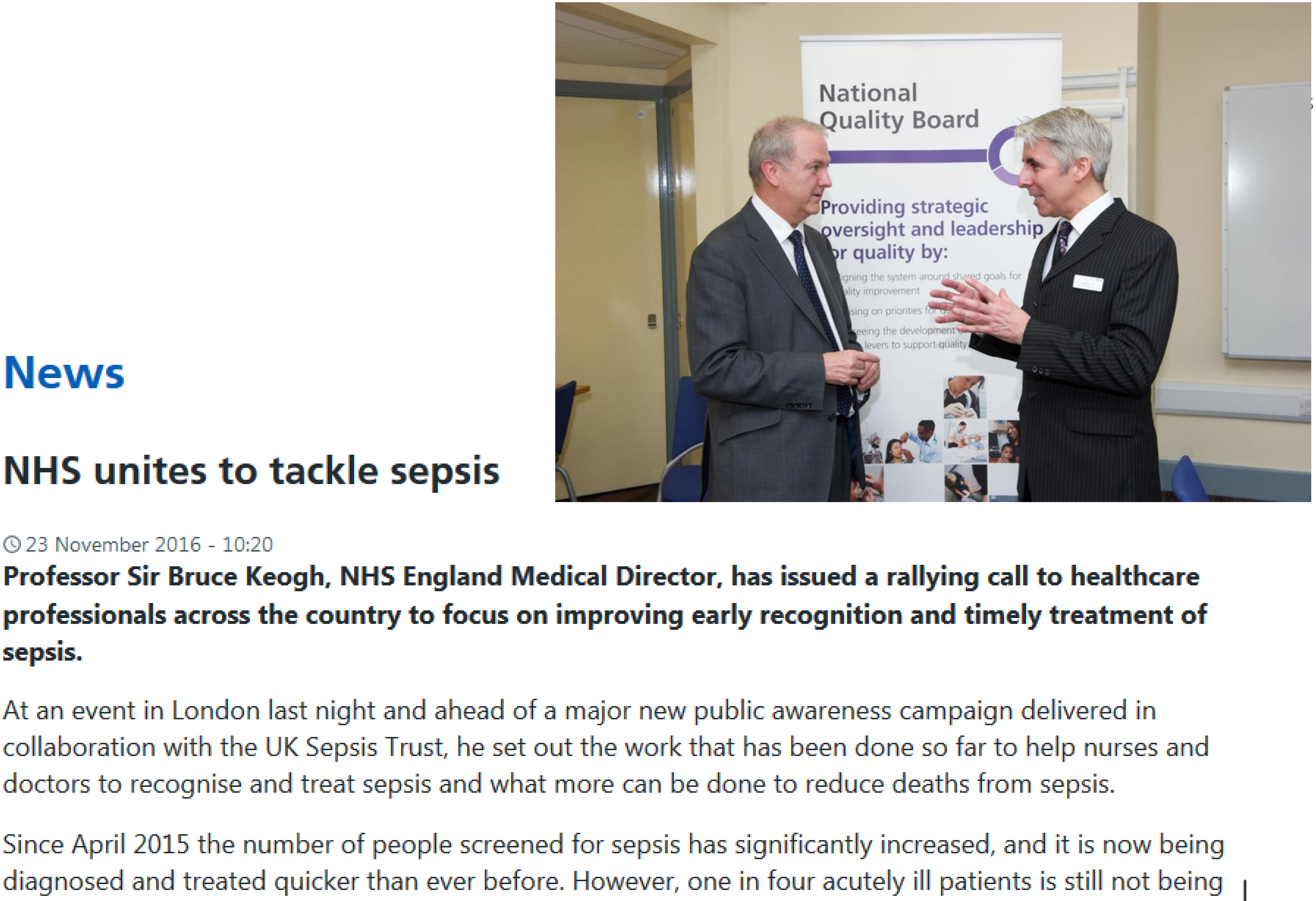
Patient safety
looking ▪ learning ▪ acting

SEPSIS KILLS
RECOGNISE • RESUSCITATE • REFER

September 13 2016 | World Sepsis Day

Increase in Sepsis Awareness 2013-2016

USA	44% to 55%
UK	40% to 60%
Germany	49% to 62%



News

NHS unites to tackle sepsis

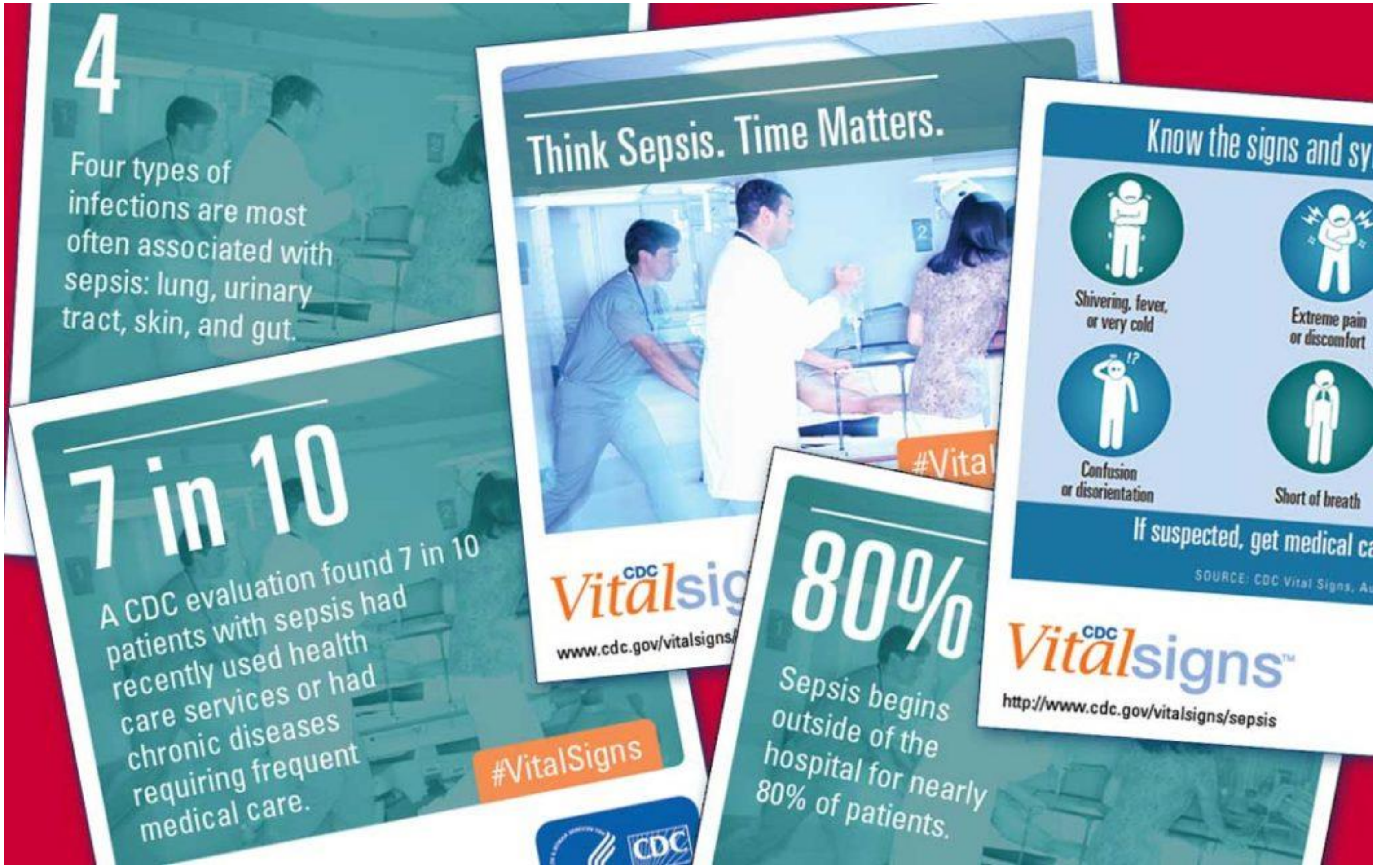
23 November 2016 - 10:20

Professor Sir Bruce Keogh, NHS England Medical Director, has issued a rallying call to healthcare professionals across the country to focus on improving early recognition and timely treatment of sepsis.

At an event in London last night and ahead of a major new public awareness campaign delivered in collaboration with the UK Sepsis Trust, he set out the work that has been done so far to help nurses and doctors to recognise and treat sepsis and what more can be done to reduce deaths from sepsis.

Since April 2015 the number of people screened for sepsis has significantly increased, and it is now being diagnosed and treated quicker than ever before. However, one in four acutely ill patients is still not being

CDC Launches Report & Awareness Initiative



4

Four types of infections are most often associated with sepsis: lung, urinary tract, skin, and gut.

7 in 10

A CDC evaluation found 7 in 10 patients with sepsis had recently used health care services or had chronic diseases requiring frequent medical care.

Think Sepsis. Time Matters.

80%

Sepsis begins outside of the hospital for nearly 80% of patients.

Know the signs and sy

If suspected, get medical ca

#VitalSigns
#Vital
CDC Vitalsig
www.cdc.gov/vitalsigns/
Shivering, fever, or very cold
Extreme pain or discomfort
Confusion or disorientation
Short of breath
SOURCE: CDC Vital Signs, Au
CDC Vitalsigns™
http://www.cdc.gov/vitalsigns/sepsis
CDC

CLINICAL FO

FROM REVIEW

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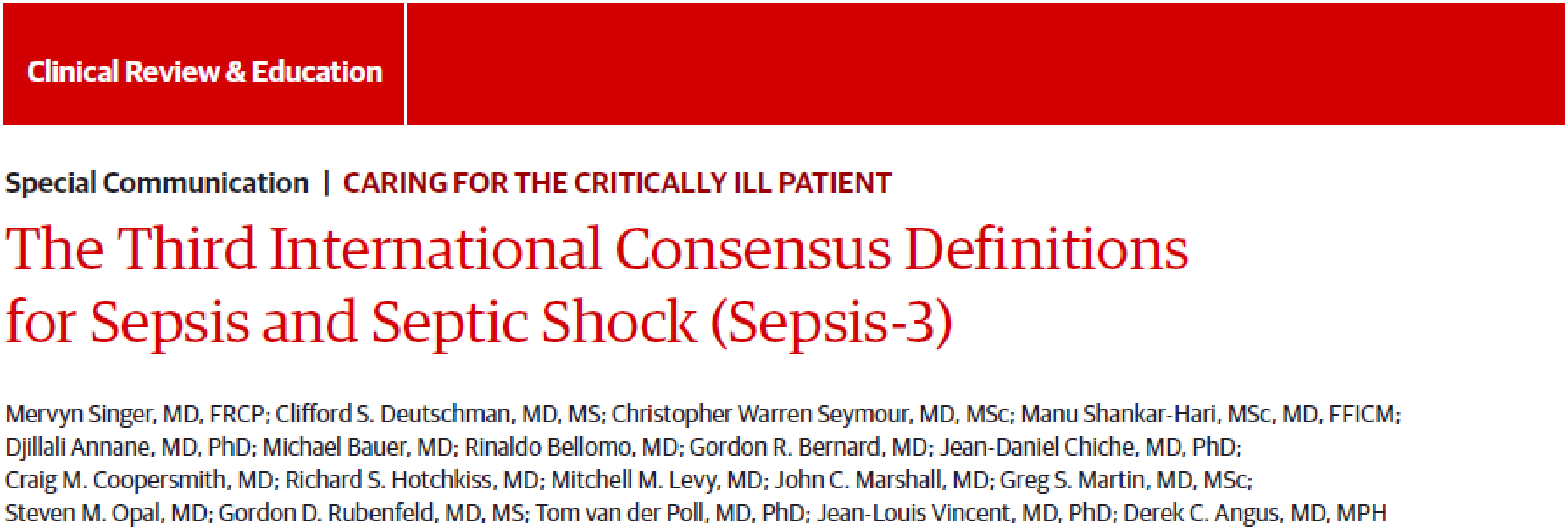

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“Sepsis is the primary cause of death from infection,especially if not recognized and treated promptly.Its recognition mandates urgent attention “

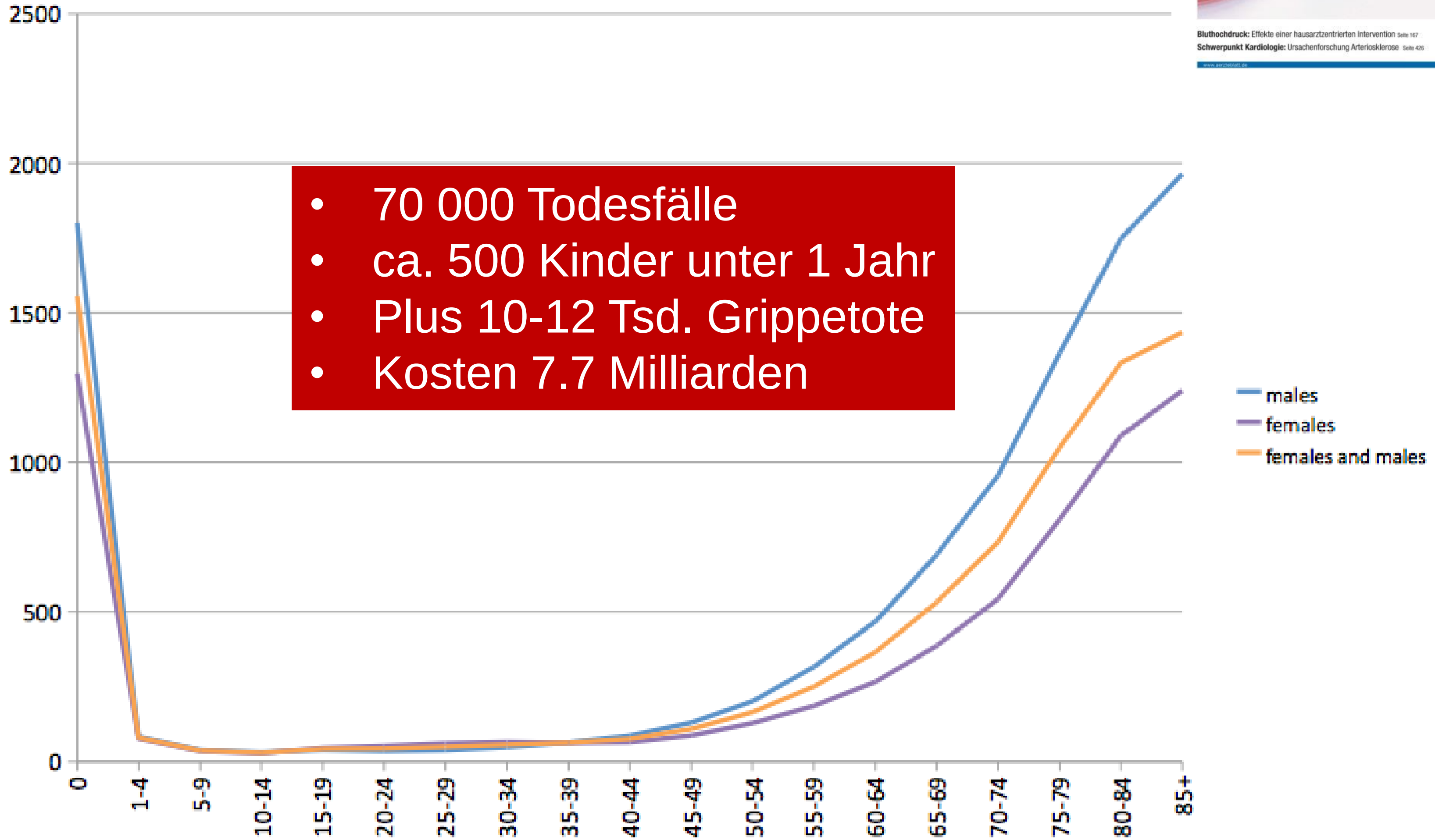
Sepsis is a life-threatening condition that arises when the body’s response to an infection injures its own tissues and organs

September 13 2014 World Sepsis Day

Früh- und Neugeborene sowie Ältere sind besonders stark betroffen

Deutsches Ärzteblatt
10
SEPSIS
Fallzahlen und Sterblichkeit

Bluthochdruck: Effekte einer hausarztzentrierten Intervention Seite 167
Schwerpunkt Kardiologie: Ursachenforschung Arteriosklerose Seite 426



- 70 000 Todesfälle
- ca. 500 Kinder unter 1 Jahr
- Plus 10-12 Tsd. Grippetote
- Kosten 7.7 Milliarden

World
Sepsis
Day

Fleischmann et al DÄB 2016

stop
sepsis
save
lives

WHO / WHA / Sepsis Resolution – Opportunities & Challenges

K. Reinhart ML
Chairman Global Sepsis Alliance

Strategy for 2017- 2020

- Foster the collaboration with WHO to achieve the requests of the resolution
- Achieve adequate representation if sepsis in the GBDR and the WHO ICD 11 coding system
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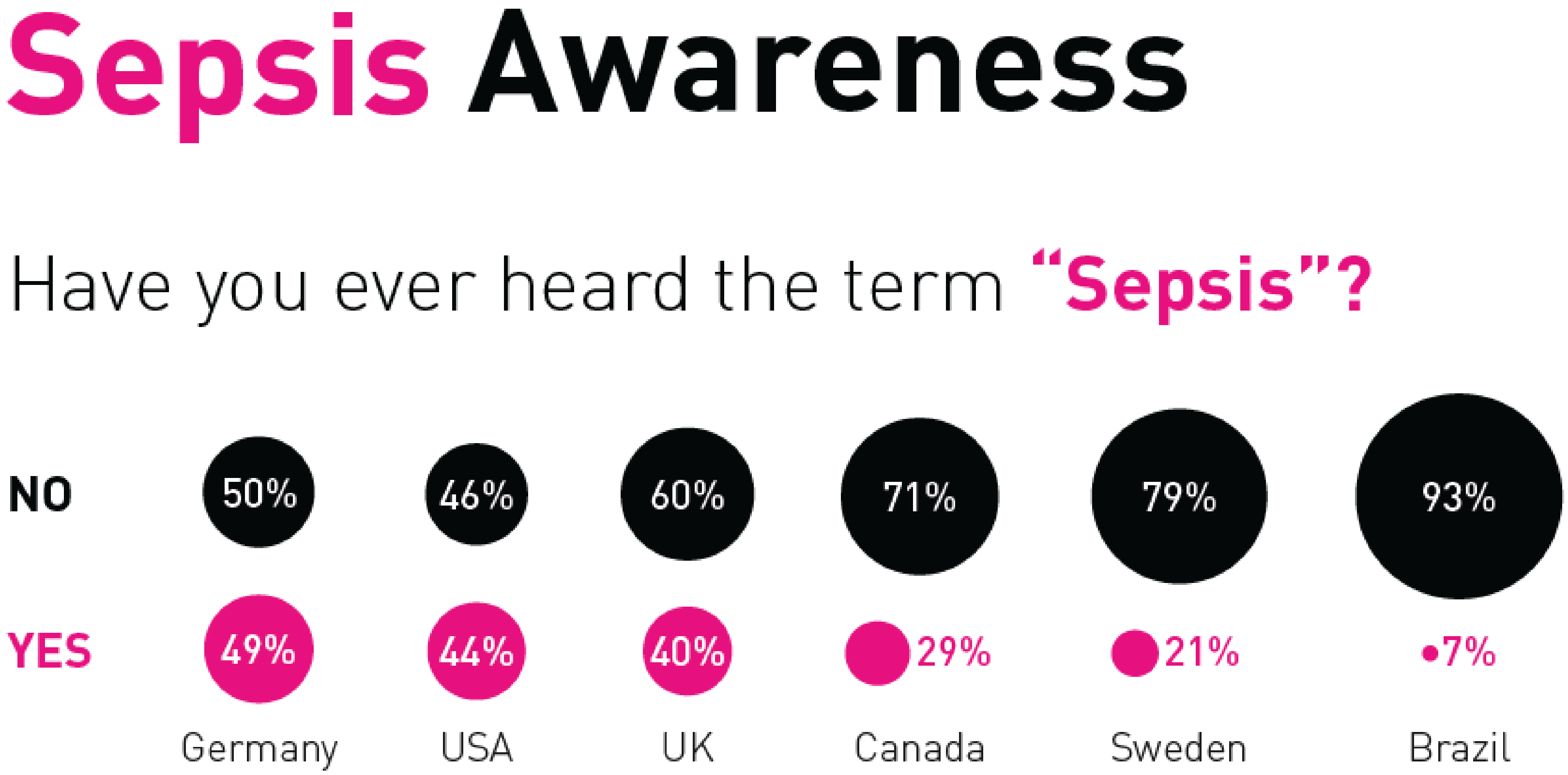
The majority of poeple have not heard the term sepsis in 2013



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September | World
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National
Quality Board
Providing strategic
oversight and leadership
or quality by:

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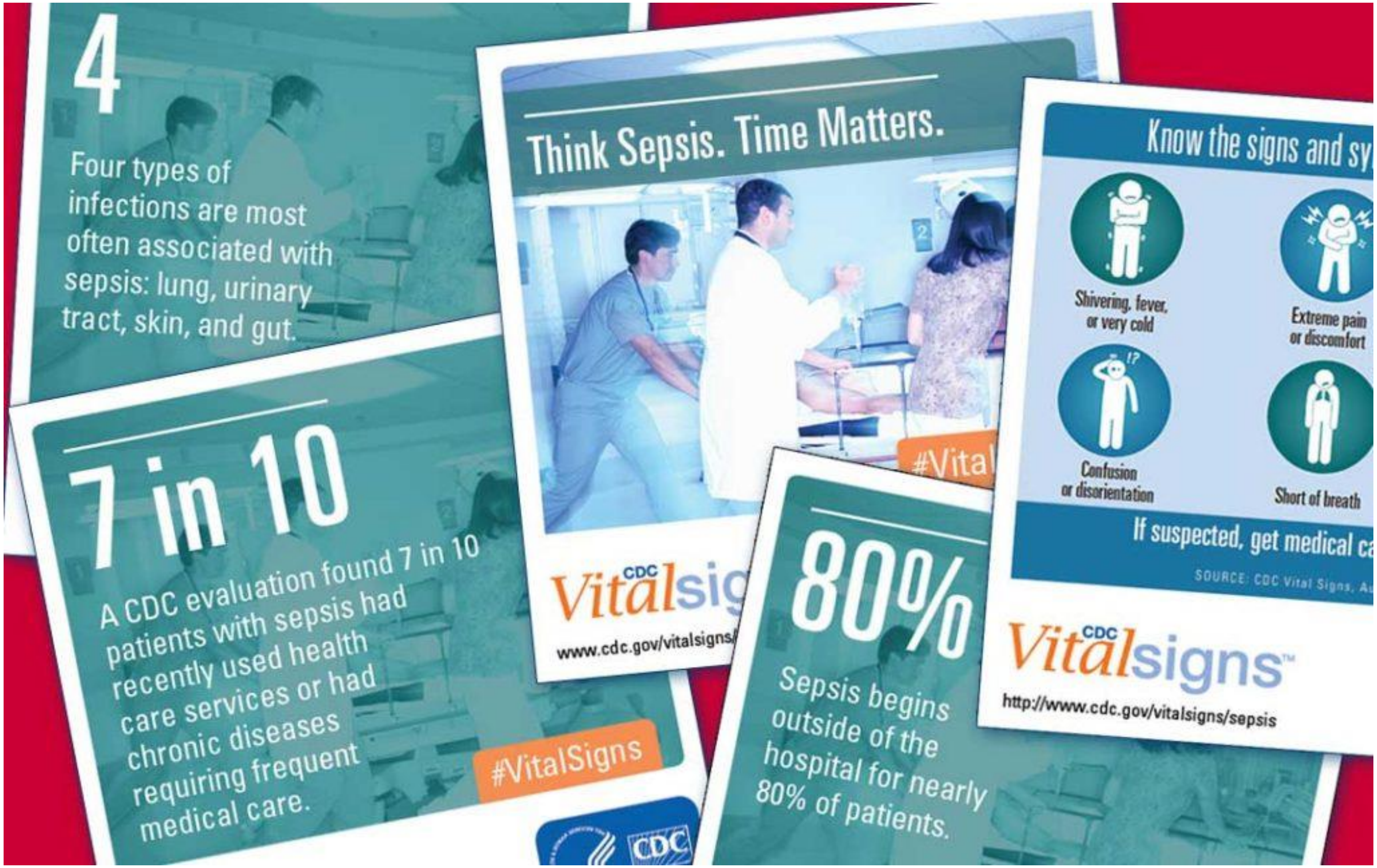

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SOURCE: CDC Vital Signs, Au

CDC Vitalsigns™

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Früh- und Neugeborene sowie Ältere sind besonders stark betroffen

Deutsches Ärzteblatt 10

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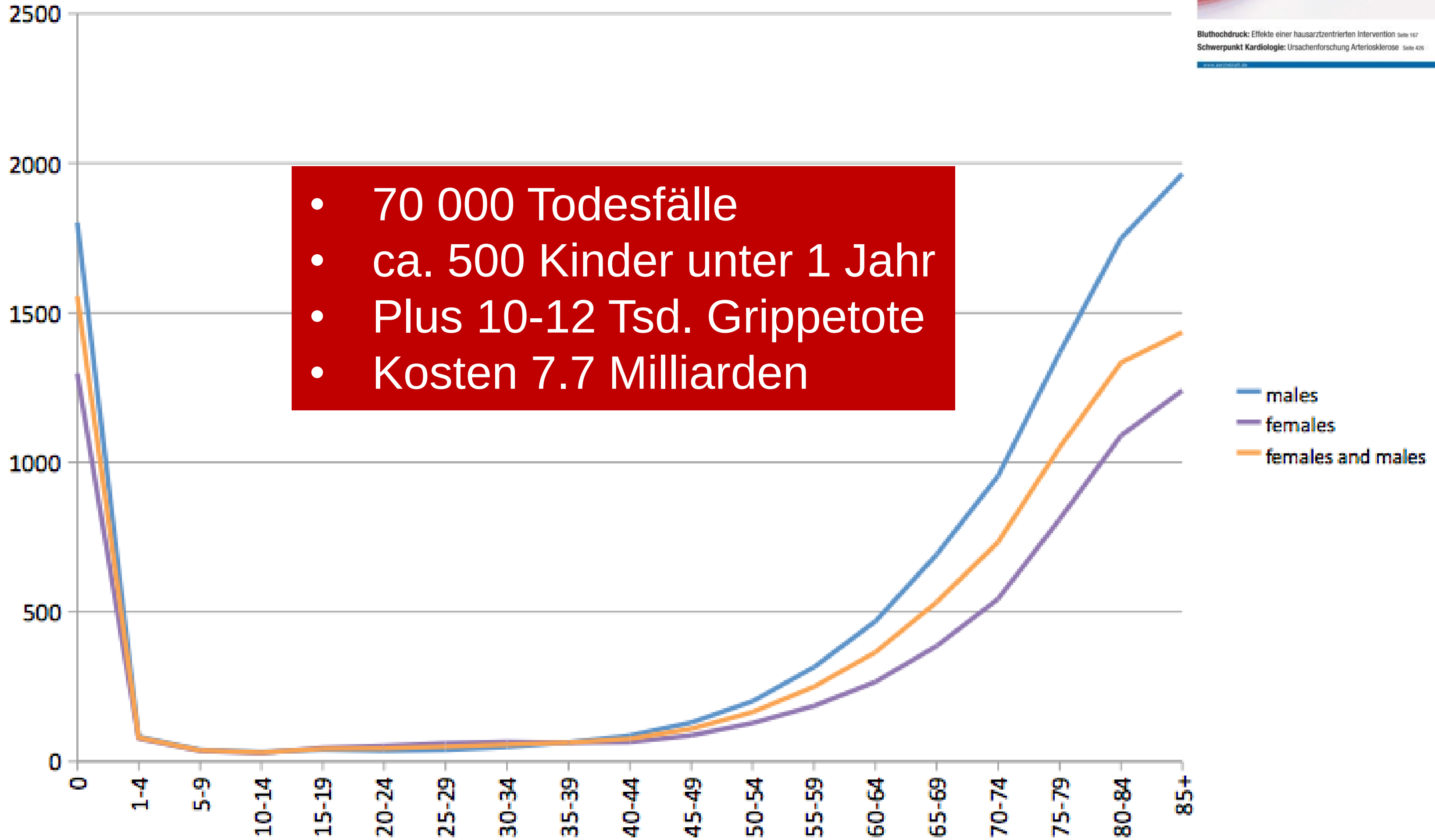

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TABLE 2. Target Mortality Rate and Odds Ratio of In-Hospital Mortality per Participation Month[a] Over Study Time and Effect on Absolute Mortality Rate in Participating and Nonparticipating ICUs

	Patients at Risk	Mortality Rate in First Quarter of Study Period/Participation Period (%)	Odds Ratio[a] (95% CI) of Mortality per Month of Study Period/Participation Period	Absolute Mortality Rate Change Over 3.5 Yr (%)
All patients[a]	213,667	13.0	0.995 (0.994–0.997)	−1.8[b]
Nonparticipating ICUs				
All patients	115,602	13.0	0.999 (0.996–1.002)	−0.4
Patients without diagnosis severe sepsis or septic shock	107,571	11.4	0.999 (0.996–1.002)	−0.3
Patients with severe sepsis or septic shock	8,031	33.8	0.997 (0.993–1.002)	−1.7
Participating ICUs				
All patients	98,065	13.1	0.995 (0.992–0.997)	−2.0[b]
All nonscreened patients	22,821	13.0	1.004 (0.996–1.013)	1.2
All screened patients	75,244	13.1	0.994 (0.991–0.998)	−2.3[b]
Screened patients without diagnosis severe sepsis or septic shock	66,857	10.0	0.995 (0.9906–0.9996)	−1.9[b]
Screened patients with severe sepsis or septic shock	8,387	31.1	0.992 (0.986–0.997)	−5.8[b]

Guideline Bundles Adherence and Mortality in Severe Sepsis and Septic Shock

Arthur R. H. van Zanten, MD, PhD[1]; Sylvia Brinkman, PhD[2,3]; M. Sesmu Arbous, MD, PhD[2,4];
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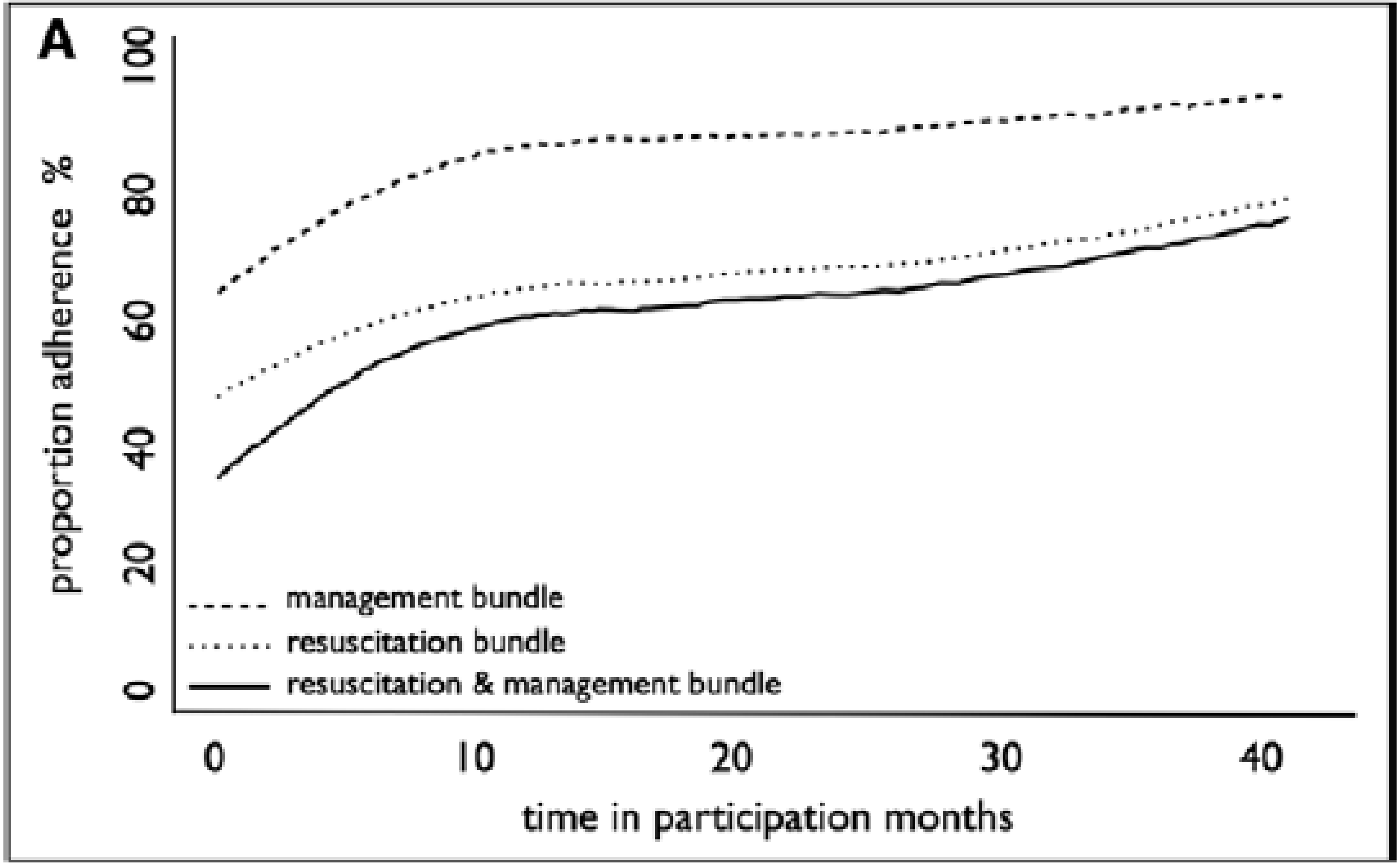

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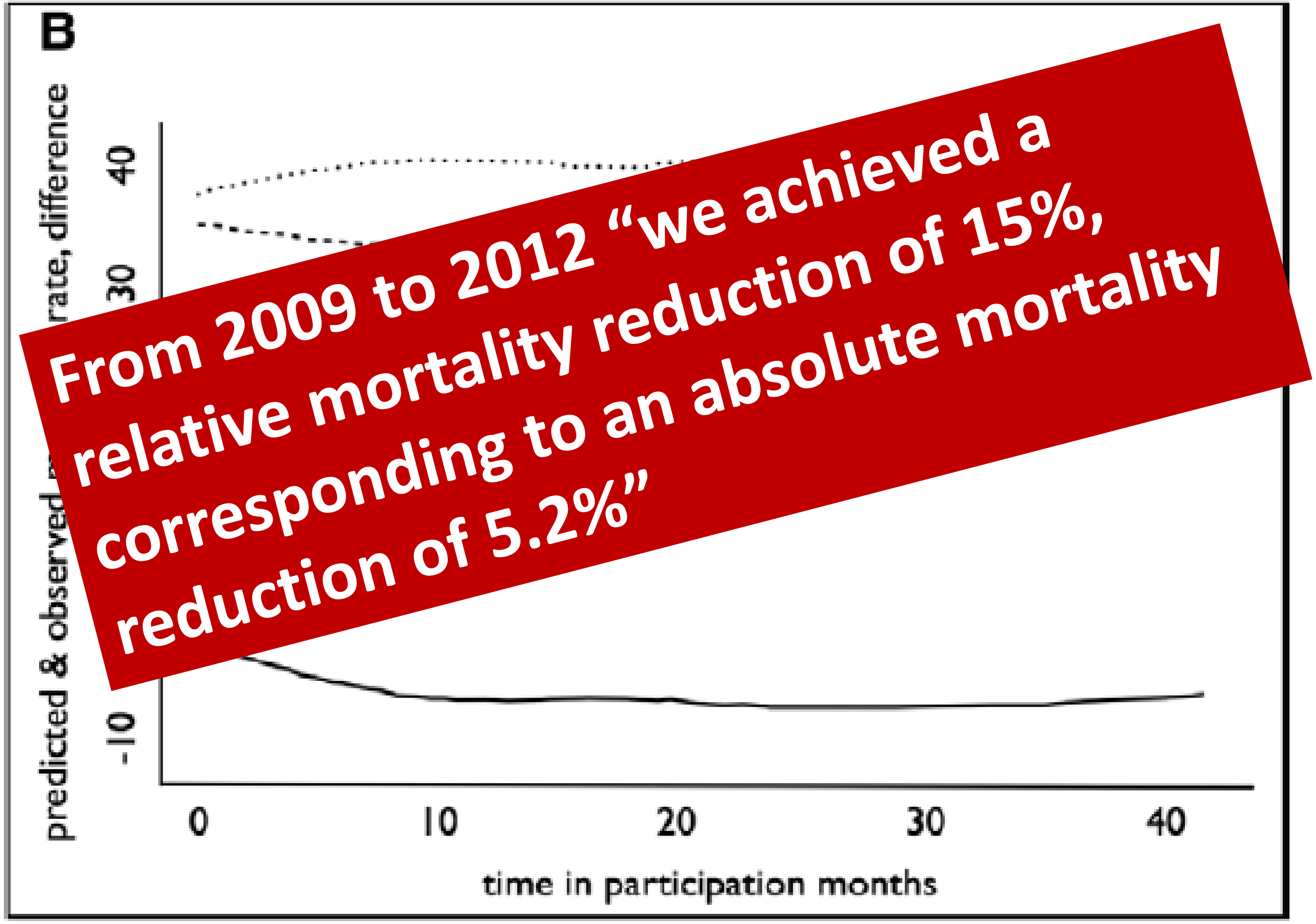
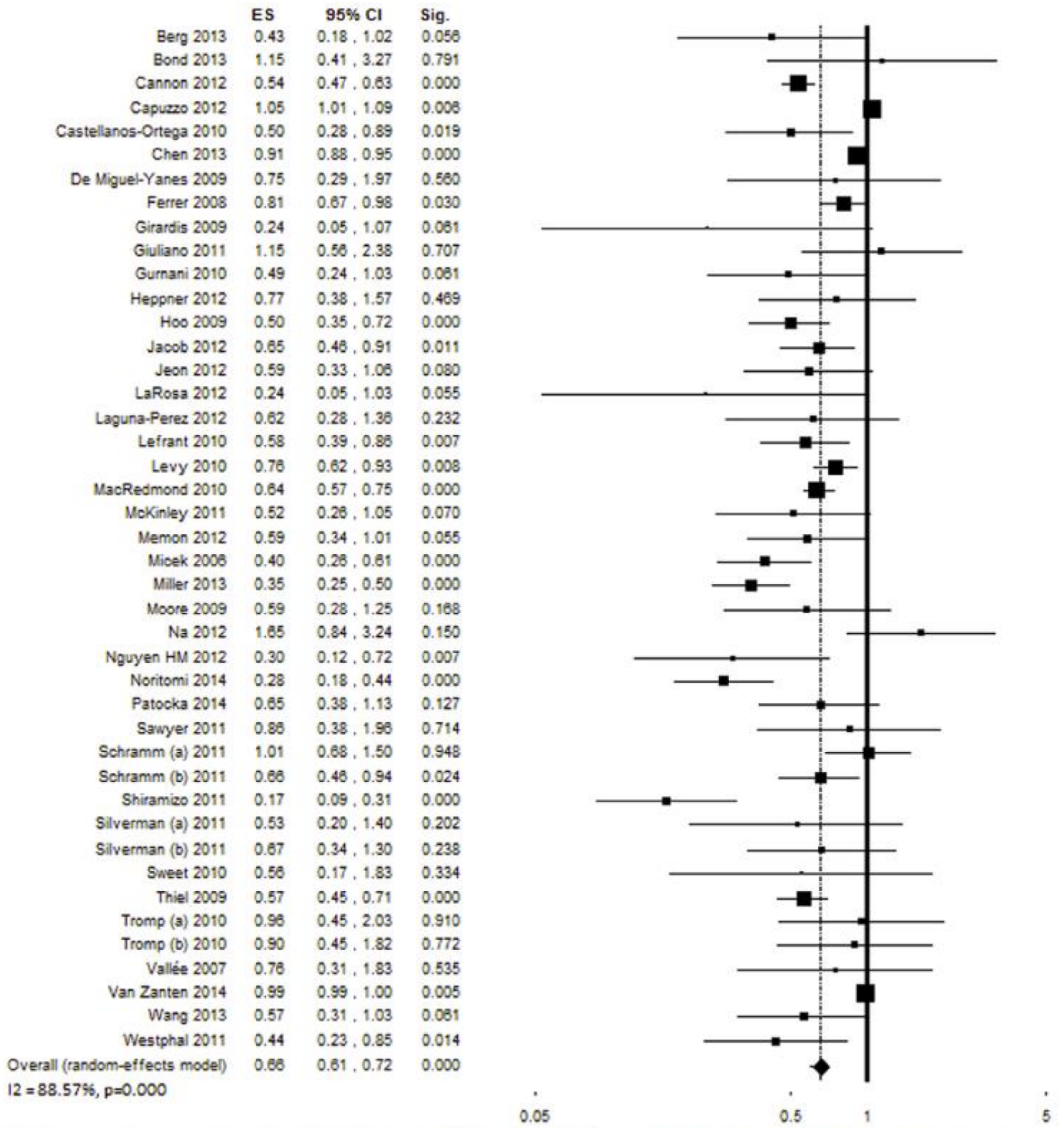


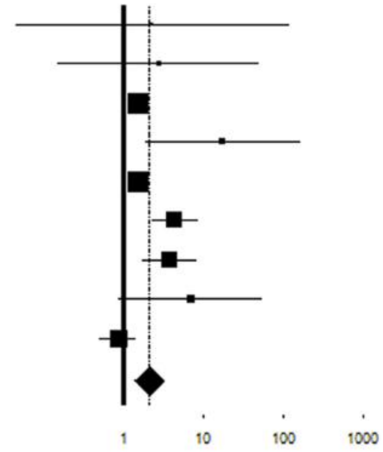
From 2009 to 2012 “we achieved a relative mortality reduction of 15%, corresponding to an absolute mortality reduction of 5.2%”



	ES	95% CI	Sig.
Berg 2013	0.43	0.18 , 1.02	0.056
Bond 2013	1.15	0.41 , 3.27	0.791
Cannon 2012	0.54	0.47 , 0.63	0.000
Capuzzo 2012	1.05	1.01 , 1.09	0.006
Castellanos-Ortega 2010	0.50	0.28 , 0.89	0.019
Chen 2013	0.91	0.88 , 0.95	0.000
De Miguel-Yanes 2009	0.75	0.29 , 1.97	0.560
Ferrer 2008	0.81	0.67 , 0.98	0.030
Girardis 2009	0.24	0.05 , 1.07	0.061
Giuliano 2011	1.15	0.56 , 2.38	0.707
Gurnani 2010	0.49	0.24 , 1.03	0.061
Heppner 2012	0.77	0.38 , 1.57	0.469
Hoo 2009	0.50	0.35 , 0.72	0.000
Jacob 2012	0.65	0.46 , 0.91	0.011
Jeon 2012	0.59	0.33 , 1.06	0.080
LaRosa 2012	0.24	0.05 , 1.03	0.055
Laguna-Perez 2012	0.62	0.28 , 1.36	0.232
Lefrant 2010	0.58	0.39 , 0.86	0.007
Levy 2010	0.76	0.62 , 0.93	0.008
MacRedmond 2010	0.64	0.57 , 0.75	0.000
McKinley 2011	0.52	0.26 , 1.05	0.070
Memon 2012	0.59	0.34 , 1.01	0.055
Micek 2006	0.40	0.26 , 0.61	0.000
Miller 2013	0.35	0.25 , 0.50	0.000
Moore 2009	0.59	0.28 , 1.25	0.168
Na 2012	1.65	0.84 , 3.24	0.150
Nguyen HM 2012	0.30	0.12 , 0.72	0.007
Noritomi 2014	0.28	0.18 , 0.44	0.000
Patocka 2014	0.65	0.38 , 1.13	0.127
Sawyer 2011	0.86	0.38 , 1.96	0.714
Schramm (a) 2011	1.01	0.68 , 1.50	0.948
Schramm (b) 2011	0.66	0.46 , 0.94	0.024
Shiramizo 2011	0.17	0.09 , 0.31	0.000
Silverman (a) 2011	0.53	0.20 , 1.40	0.202
Silverman (b) 2011	0.67	0.34 , 1.30	0.238
Sweet 2010	0.56	0.17 , 1.83	0.334
Thiel 2009	0.57	0.45 , 0.71	0.000
Tromp (a) 2010	0.96	0.45 , 2.03	0.910
Tromp (b) 2010	0.90	0.45 , 1.82	0.772
Vallée 2007	0.76	0.31 , 1.83	0.535
Van Zanten 2014	0.99	0.99 , 1.00	0.005
Wang 2013	0.57	0.31 , 1.03	0.061
Westphal 2011	0.44	0.23 , 0.85	0.014
Overall (random-effects model)	0.66	0.61 , 0.72	0.000

I2 = 88.57%, p=0.000

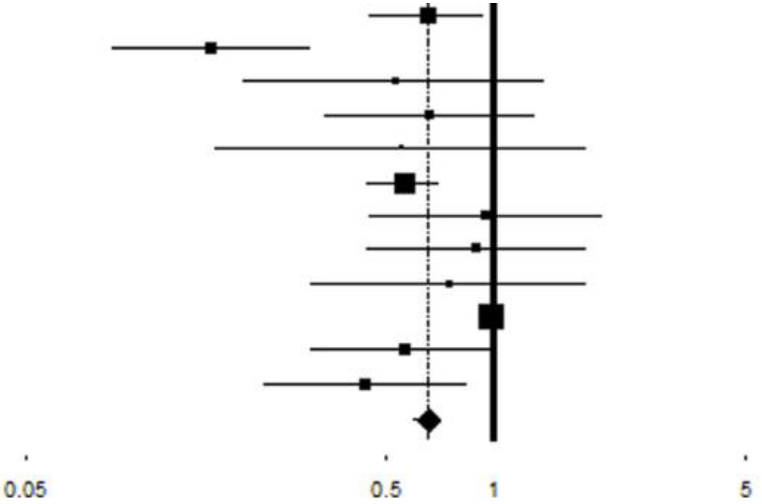
Fig 7. Forest plot showing individual and overall ES of studies that evaluated changes in mortality following the implementation of the



	ES	95% CI	Sig.
Berg 2013	2.40	0.05 , 123.13	0.664
Castellanos-Ortega 2010	2.80	0.15 , 51.02	0.488
Ferrer 2008	1.52	1.18 , 1.97	0.001
Girardis 2009	18.00	1.94 , 166.98	0.011
Levy 2010	1.52	1.22 , 1.90	0.000
Shiramizo 2011	4.53	2.35 , 8.76	0.000
Van Zanten 2014	3.87	1.77 , 8.46	0.001
Wang 2013	7.20	0.90 , 57.39	0.062
Westphal 2011	0.88	0.52 , 1.50	0.643
Overall (random-effects model)	2.11	1.41 , 3.15	0.000

I2 = 69.55%, p=0.001

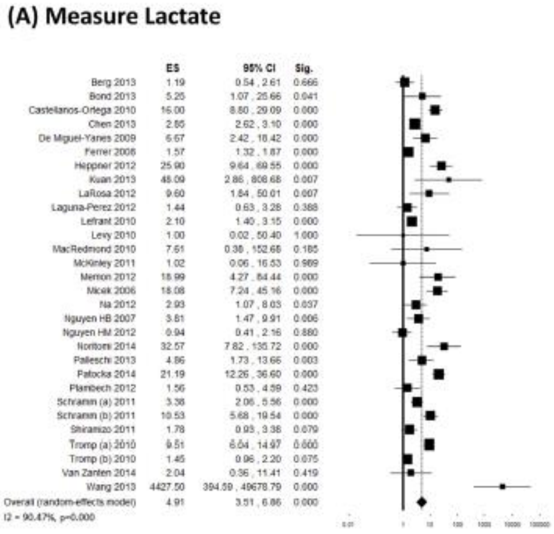
Fig 5. Forest plot showing individual and overall ES of studies that evaluated changes in compliance with the complete 24-hour bundle following the implementation of the performance improvement program (k = 11). The size of the boxes is inversely proportional to the size of the result study



Schramm (b) 2011	0.66	0.46 , 0.94	0.024
Shiramizo 2011	0.17	0.09 , 0.31	0.000
Silverman (a) 2011	0.53	0.20 , 1.40	0.202
Silverman (b) 2011	0.67	0.34 , 1.30	0.238
Sweet 2010	0.56	0.17 , 1.83	0.334
Thiel 2009	0.57	0.45 , 0.71	0.000
Tromp (a) 2010	0.96	0.45 , 2.03	0.910
Tromp (b) 2010	0.90	0.45 , 1.82	0.772
Vallée 2007	0.76	0.31 , 1.83	0.535
Van Zanten 2014	0.99	0.99 , 1.00	0.005
Wang 2013	0.57	0.31 , 1.03	0.061
Westphal 2011	0.44	0.23 , 0.85	0.014
Overall (random-effects model)	0.66	0.61 , 0.72	0.000

I2 = 88.57%, p=0.000

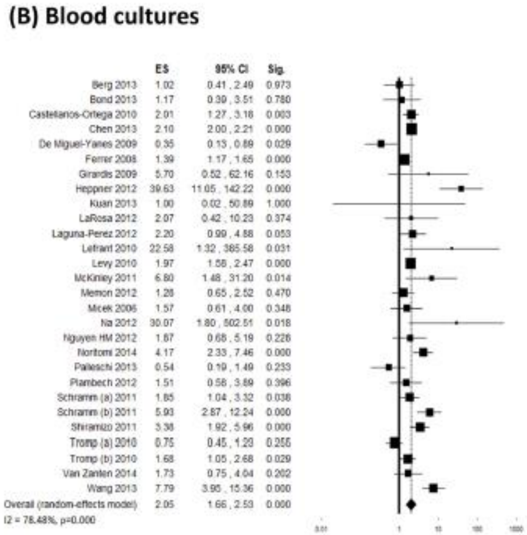
Fig 7. Forest plot showing individual and overall ES of studies that evaluated changes in mortality following the implementation of the performance improvement program (k = 48). The size of the boxes is inversely proportional to the size of the result study variance, so that more precise



(A) Measure Lactate

	ES	95% CI	Sig.
Berg 2013	1.19	0.54 , 2.61	0.666
Bond 2013	5.25	1.07 , 25.66	0.041
Castellanos-Ortega 2010	16.00	8.80 , 29.09	0.000
Chen 2013	2.85	2.62 , 3.10	0.000
De Miguel-Yanes 2009	6.67	2.42 , 18.42	0.000
Ferrer 2008	1.57	1.32 , 1.87	0.000
Heppner 2012	25.90	9.64 , 69.55	0.000
Kuan 2013	48.09	2.86 , 808.68	0.007
LaRosa 2012	9.60	1.84 , 50.01	0.007
Laguna-Perez 2012	1.44	0.63 , 3.28	0.388
Lefrant 2010	2.10	1.40 , 3.15	0.000
Levy 2010	1.00	0.02 , 50.40	1.000
MacRedmond 2010	7.61	0.38 , 152.68	0.185
McKinley 2011	1.02	0.06 , 16.53	0.989
Memon 2012	18.99	4.27 , 84.44	0.000
Micek 2006	18.08	7.24 , 45.16	0.000
Na 2012	2.93	1.07 , 8.03	0.037
Nguyen HB 2007	3.81	1.47 , 9.91	0.006
Nguyen HM 2012	0.94	0.41 , 2.16	0.880
Noritomi 2014	32.57	7.82 , 135.72	0.000
Palleschi 2013	4.86	1.73 , 13.66	0.003
Patocka 2014	21.19	12.26 , 36.60	0.000
Plambech 2012	1.56	0.53 , 4.59	0.423
Schramm (a) 2011	3.38	2.06 , 5.56	0.000
Schramm (b) 2011	10.53	5.68 , 19.54	0.000
Shiramizo 2011	1.78	0.93 , 3.38	0.079
Tromp (a) 2010	9.51	6.04 , 14.97	0.000
Tromp (b) 2010	1.45	0.96 , 2.20	0.075
Van Zanten 2014	2.04	0.36 , 11.41	0.419
Wang 2013	4427.50	394.59 , 49678.79	0.000
Overall (random-effects model)	4.91	3.51 , 6.86	0.000

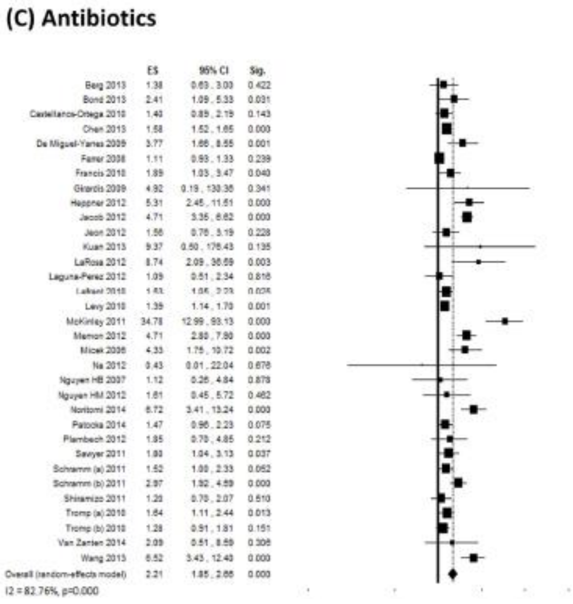
I2 = 90.47%, p=0.000



(B) Blood cultures

	ES	95% CI	Sig.
Berg 2013	1.02	0.41 , 2.49	0.973
Bond 2013	1.17	0.39 , 3.51	0.780
Castellanos-Ortega 2010	2.01	1.27 , 3.18	0.003
Chen 2013	2.10	2.00 , 2.21	0.000
De Miguel-Yanes 2009	0.35	0.13 , 0.89	0.029
Ferrer 2008	1.39	1.17 , 1.65	0.000
Girardis 2009	5.70	0.52 , 62.16	0.153
Heppner 2012	39.63	11.05 , 142.22	0.000
Kuan 2013	1.00	0.02 , 50.89	1.000
LaRosa 2012	2.07	0.42 , 10.23	0.374
Laguna-Perez 2012	2.20	0.99 , 4.88	0.053
Lefrant 2010	22.58	1.32 , 385.58	0.031
Levy 2010	1.97	1.58 , 2.47	0.000
McKinley 2011	6.80	1.48 , 31.20	0.014
Memon 2012	1.28	0.65 , 2.52	0.470
Micek 2006	1.57	0.61 , 4.00	0.348
Na 2012	30.07	1.80 , 502.51	0.018
Nguyen HM 2012	1.87	0.68 , 5.19	0.226
Noritomi 2014	4.17	2.33 , 7.46	0.000
Palleschi 2013	0.54	0.19 , 1.49	0.233
Plambech 2012	1.51	0.58 , 3.89	0.396
Schramm (a) 2011	1.85	1.04 , 3.32	0.038
Schramm (b) 2011	5.93	2.87 , 12.24	0.000
Shiramizo 2011	3.38	1.92 , 5.96	0.000
Tromp (a) 2010	0.75	0.45 , 1.23	0.255
Tromp (b) 2010	1.68	1.05 , 2.68	0.029
Van Zanten 2014	1.73	0.75 , 4.04	0.202
Wang 2013	7.79	3.95 , 15.36	0.000
Overall (random-effects model)	2.05	1.66 , 2.53	0.000

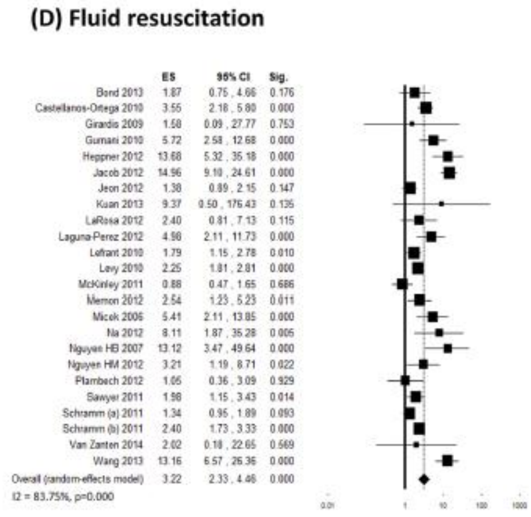
I2 = 78.48%, p=0.000



(C) Antibiotics

	ES	95% CI	Sig.
Berg 2013	1.38	0.63 , 3.00	0.422
Bond 2013	2.41	1.09 , 5.33	0.031
Castellanos-Ortega 2010	1.40	0.89 , 2.19	0.143
Chen 2013	1.58	1.52 , 1.65	0.000
De Miguel-Yanes 2009	3.77	1.66 , 8.55	0.001
Ferrer 2008	1.11	0.93 , 1.33	0.239
Francis 2010	1.89	1.03 , 3.47	0.040
Girardis 2009	4.92	0.19 , 130.36	0.341
Heppner 2012	5.31	2.45 , 11.51	0.000
Jacob 2012	4.71	3.35 , 6.62	0.000
Jeon 2012	1.56	0.76 , 3.19	0.228
Kuan 2013	9.37	0.50 , 176.43	0.135
LaRosa 2012	8.74	2.09 , 36.59	0.003
Laguna-Perez 2012	1.09	0.51 , 2.34	0.816
Lefrant 2010	1.53	1.05 , 2.23	0.025
Levy 2010	1.39	1.14 , 1.70	0.001
McKinley 2011	34.78	12.99 , 93.13	0.000
Memon 2012	4.71	2.80 , 7.90	0.000
Micek 2006	4.33	1.75 , 10.72	0.002
Na 2012	0.43	0.01 , 22.04	0.676
Nguyen HB 2007	1.12	0.26 , 4.84	0.878
Nguyen HM 2012	1.61	0.45 , 5.72	0.462
Noritomi 2014	6.72	3.41 , 13.24	0.000
Patocka 2014	1.47	0.96 , 2.23	0.075
Plambech 2012	1.85	0.70 , 4.85	0.212
Sawyer 2011	1.80	1.04 , 3.13	0.037
Schramm (a) 2011	1.52	1.00 , 2.33	0.052
Schramm (b) 2011	2.97	1.92 , 4.59	0.000
Shiramizo 2011	1.20	0.70 , 2.07	0.510
Tromp (a) 2010	1.64	1.11 , 2.44	0.013
Tromp (b) 2010	1.28	0.91 , 1.81	0.151
Van Zanten 2014	2.09	0.51 , 8.59	0.306
Wang 2013	6.52	3.43 , 12.40	0.000
Overall (random-effects model)	2.21	1.85 , 2.65	0.000

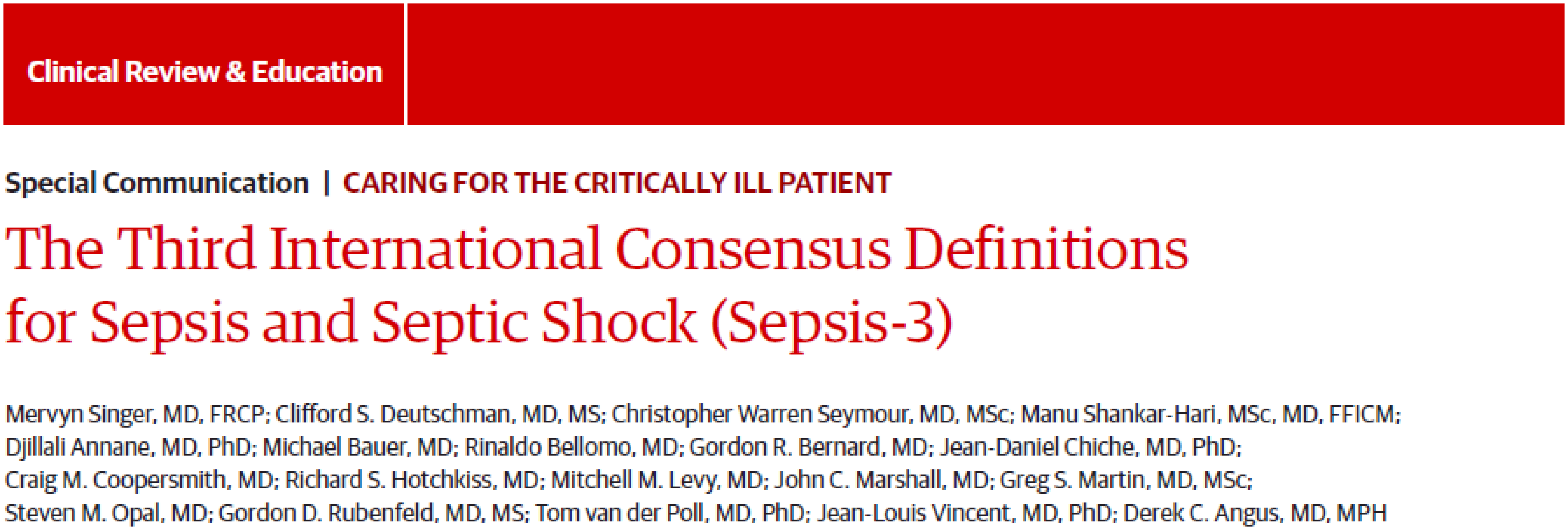
I2 = 82.76%, p=0.000



(D) Fluid resuscitation

	ES	95% CI	Sig.
Bond 2013	1.87	0.75 , 4.66	0.176
Castellanos-Ortega 2010	3.55	2.18 , 5.80	0.000
Girardis 2009	1.58	0.09 , 27.77	0.753
Gurnani 2010	5.72	2.58 , 12.68	0.000
Heppner 2012	13.68	5.32 , 35.18	0.000
Jacob 2012	14.96	9.10 , 24.61	0.000
Jeon 2012	1.38	0.89 , 2.15	0.147
Kuan 2013	9.37	0.50 , 176.43	0.135
LaRosa 2012	2.40	0.81 , 7.13	0.115
Laguna-Perez 2012	4.98	2.11 , 11.73	0.000
Lefrant 2010	1.79	1.15 , 2.78	0.010
Levy 2010	2.25	1.81 , 2.81	0.000
McKinley 2011	0.88	0.47 , 1.65	0.686
Memon 2012	2.54	1.23 , 5.23	0.011
Micek 2006	5.41	2.11 , 13.85	0.000
Na 2012	8.11	1.87 , 35.28	0.005
Nguyen HB 2007	13.12	3.47 , 49.64	0.000
Nguyen HM 2012	3.21	1.19 , 8.71	0.022
Plambech 2012	1.05	0.36 , 3.09	0.929
Sawyer 2011	1.98	1.15 , 3.43	0.014
Schramm (a) 2011	1.34	0.95 , 1.89	0.093
Schramm (b) 2011	2.40	1.73 , 3.33	0.000
Van Zanten 2014	2.02	0.18 , 22.65	0.569
Wang 2013	13.16	6.57 , 26.36	0.000
Overall (random-effects model)	3.22	2.33 , 4.46	0.000

I2 = 83.75%, p=0.000


Clinical Review & Education

Special Communication | CARING FOR THE CRITICALLY ILL PATIENT

The Third International Consensus Definitions for Sepsis and Septic Shock (Sepsis-3)

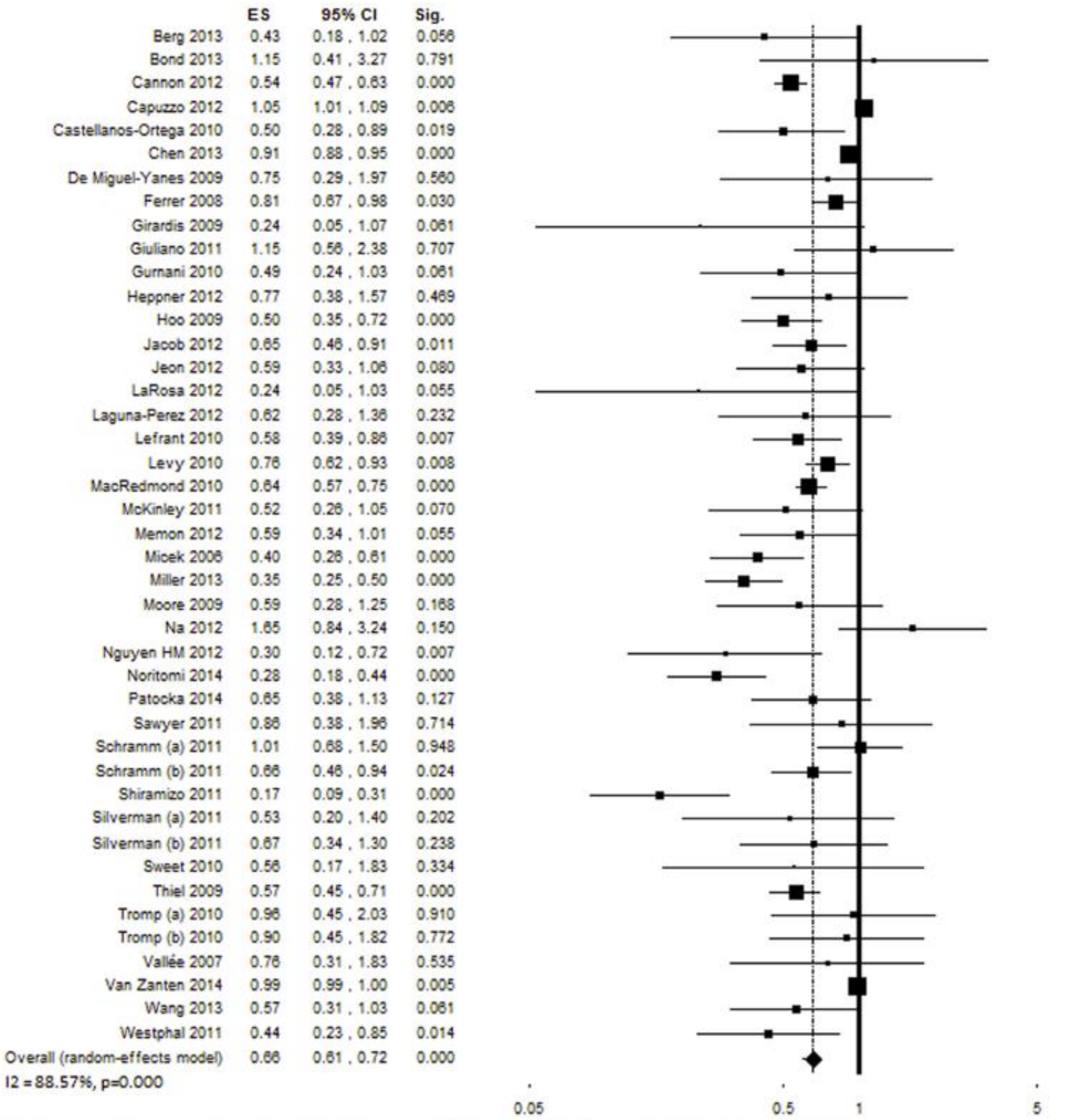
Mervyn Singer, MD, FRCP; Clifford S. Deutschman, MD, MS; Christopher Warren Seymour, MD, MSc; Manu Shankar-Hari, MSc, MD, FFICM; Djillali Annane, MD, PhD; Michael Bauer, MD; Rinaldo Bellomo, MD; Gordon R. Bernard, MD; Jean-Daniel Chiche, MD, PhD; Craig M. Coopersmith, MD; Richard S. Hotchkiss, MD; Mitchell M. Levy, MD; John C. Marshall, MD; Greg S. Martin, MD, MSc; Steven M. Opal, MD; Gordon D. Rubenfeld, MD, MS; Tom van der Poll, MD, PhD; Jean-Louis Vincent, MD, PhD; Derek C. Angus, MD, MPH

“Sepsis is the primary cause of death from infection,especially if not recognized and treated promptly.Its recognition mandates urgent attention “

Sepsis is a life-threatening condition that arises when the body’s response to an infection injures its own tissues and organs

Title
Date
Slide

September 13 2016
World Sepsis Day



	ES	95% CI	Sig.
Berg 2013	0.43	0.18 , 1.02	0.056
Bond 2013	1.15	0.41 , 3.27	0.791
Cannon 2012	0.54	0.47 , 0.63	0.000
Capuzzo 2012	1.05	1.01 , 1.09	0.006
Castellanos-Ortega 2010	0.50	0.28 , 0.89	0.019
Chen 2013	0.91	0.88 , 0.95	0.000
De Miguel-Yanes 2009	0.75	0.29 , 1.97	0.560
Ferrer 2008	0.81	0.67 , 0.98	0.030
Girardis 2009	0.24	0.05 , 1.07	0.061
Giuliano 2011	1.15	0.56 , 2.38	0.707
Gurnani 2010	0.49	0.24 , 1.03	0.061
Heppner 2012	0.77	0.38 , 1.57	0.469
Hoo 2009	0.50	0.35 , 0.72	0.000
Jacob 2012	0.65	0.46 , 0.91	0.011
Jeon 2012	0.59	0.33 , 1.06	0.080
LaRosa 2012	0.24	0.05 , 1.03	0.055
Laguna-Perez 2012	0.62	0.28 , 1.36	0.232
Lefrant 2010	0.58	0.39 , 0.86	0.007
Levy 2010	0.76	0.62 , 0.93	0.008
MacRedmond 2010	0.64	0.57 , 0.75	0.000
McKinley 2011	0.52	0.26 , 1.05	0.070
Memon 2012	0.59	0.34 , 1.01	0.055
Micek 2006	0.40	0.26 , 0.61	0.000
Miller 2013	0.35	0.25 , 0.50	0.000
Moore 2009	0.59	0.28 , 1.25	0.168
Na 2012	1.65	0.84 , 3.24	0.150
Nguyen HM 2012	0.30	0.12 , 0.72	0.007
Noritomi 2014	0.28	0.18 , 0.44	0.000
Patocka 2014	0.65	0.38 , 1.13	0.127
Sawyer 2011	0.86	0.38 , 1.96	0.714
Schramm (a) 2011	1.01	0.68 , 1.50	0.948
Schramm (b) 2011	0.66	0.46 , 0.94	0.024
Shiramizo 2011	0.17	0.09 , 0.31	0.000
Silverman (a) 2011	0.53	0.20 , 1.40	0.202
Silverman (b) 2011	0.67	0.34 , 1.30	0.238
Sweet 2010	0.56	0.17 , 1.83	0.334
Thiel 2009	0.57	0.45 , 0.71	0.000
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Fig 7. Forest plot showing individual and overall ES of studies that evaluated changes in mortality following the implementation of the