Intensivmedizin – Erreichtes und Blick in die Zukunft

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Universitätsklinikum Jena

September 13 2016 | World Sepsis Day

Outline

- Erreichtes
- Erfolgsfaktoren
- Ethische Herausforderungen
- Fortschritt durch „kreative Destruktion“

The NEW ENGLAND JOURNAL of MEDICINE

N ENGL J MED 369;7 NEJM.ORG AUGUST 15, 2013

EDITORIALS

Critical Care — An All-Encompassing Specialty

Simon Finfer, M.D., F.C.I.C.M., and Jean-Louis Vincent, M.D., Ph.D.

- **2005 US critical care cost US$81.7 billion**
- **29.2% of Medicare beneficiaries treated in an ICU during the last month of their life**

The majority of mankind does not have access to Intensive care medicine !

stop sepsis save lives

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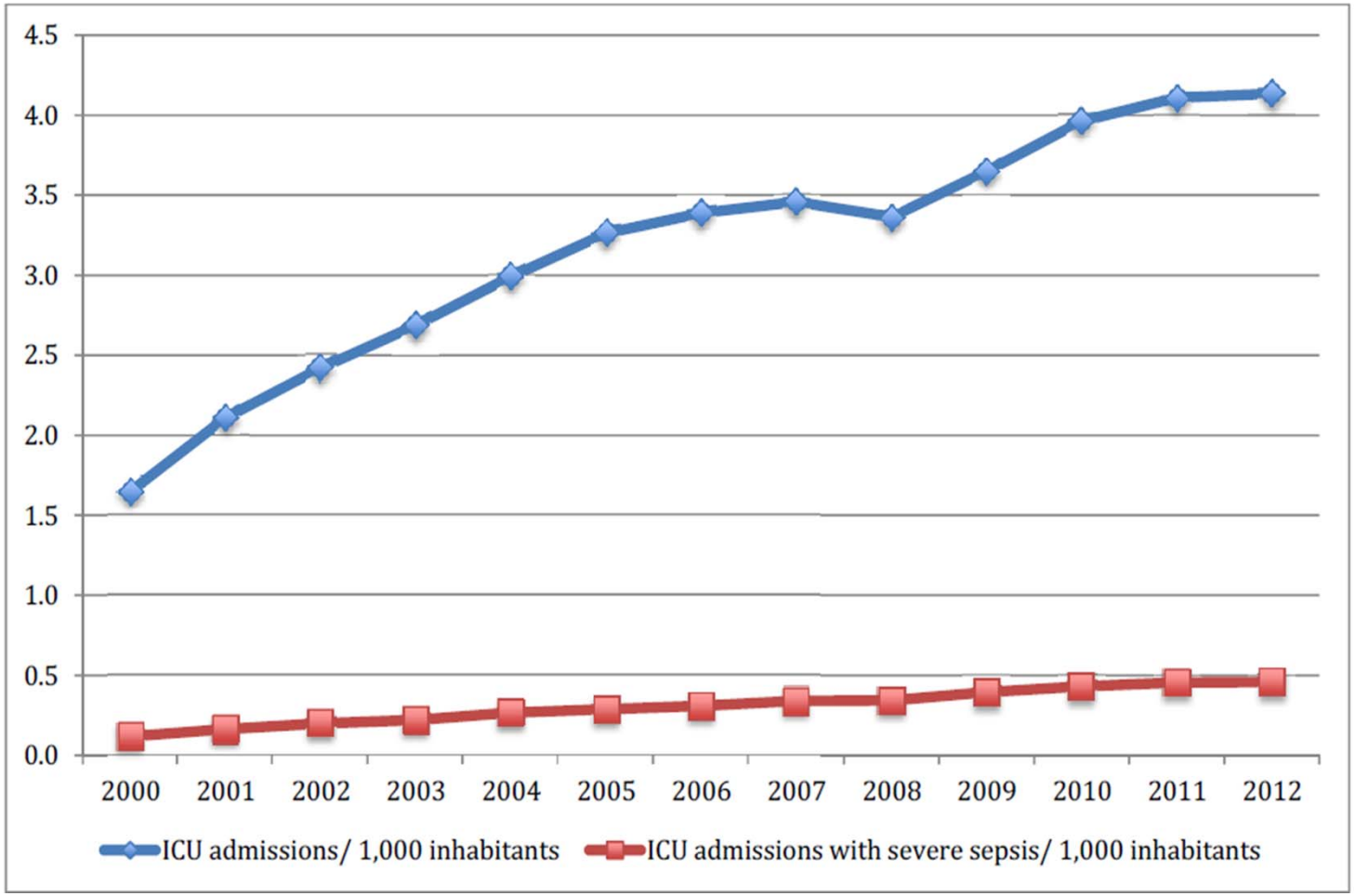
Patientin Tag 2 und Tag 7 nach Aufnahme wegen Pneumokokkensepsis

2 Jahre später 26.1.2015 Besuch auf Intensivstation

Original Investigation | CARING FOR THE CRITICALLY ILL PATIENT

Mortality Related to Severe Sepsis and Septic Shock Among Critically Ill Patients in Australia and New Zealand, 2000-2012

Kirsi-Maija Kaukonen, MD, PhD, EDIC; Michael Bailey, PhD; Satoshi Suzuki, MD; David Pilcher, FCICM; Rinaldo Bellomo, MD, PhD



Kaukonen, et al JAMA 2014

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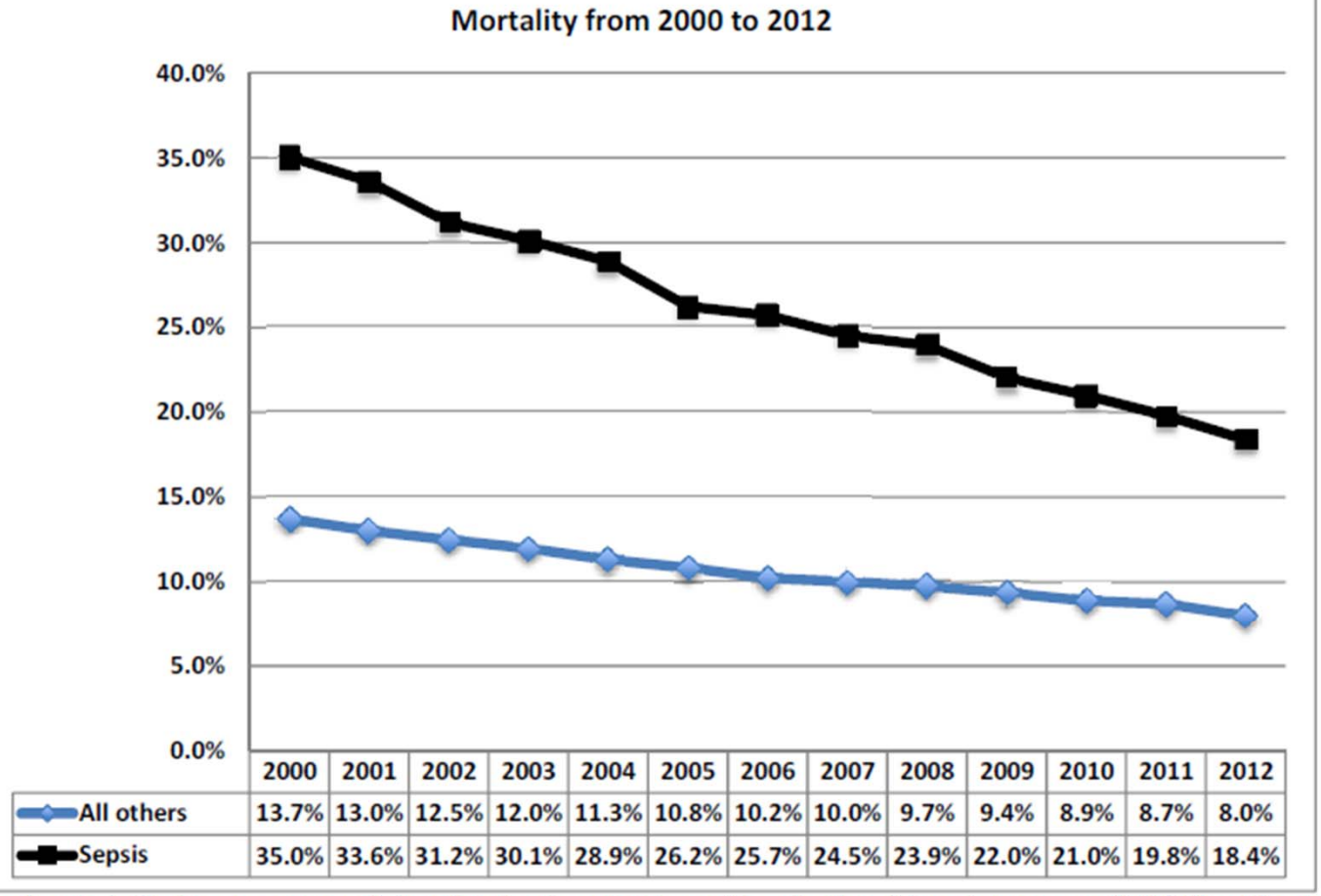
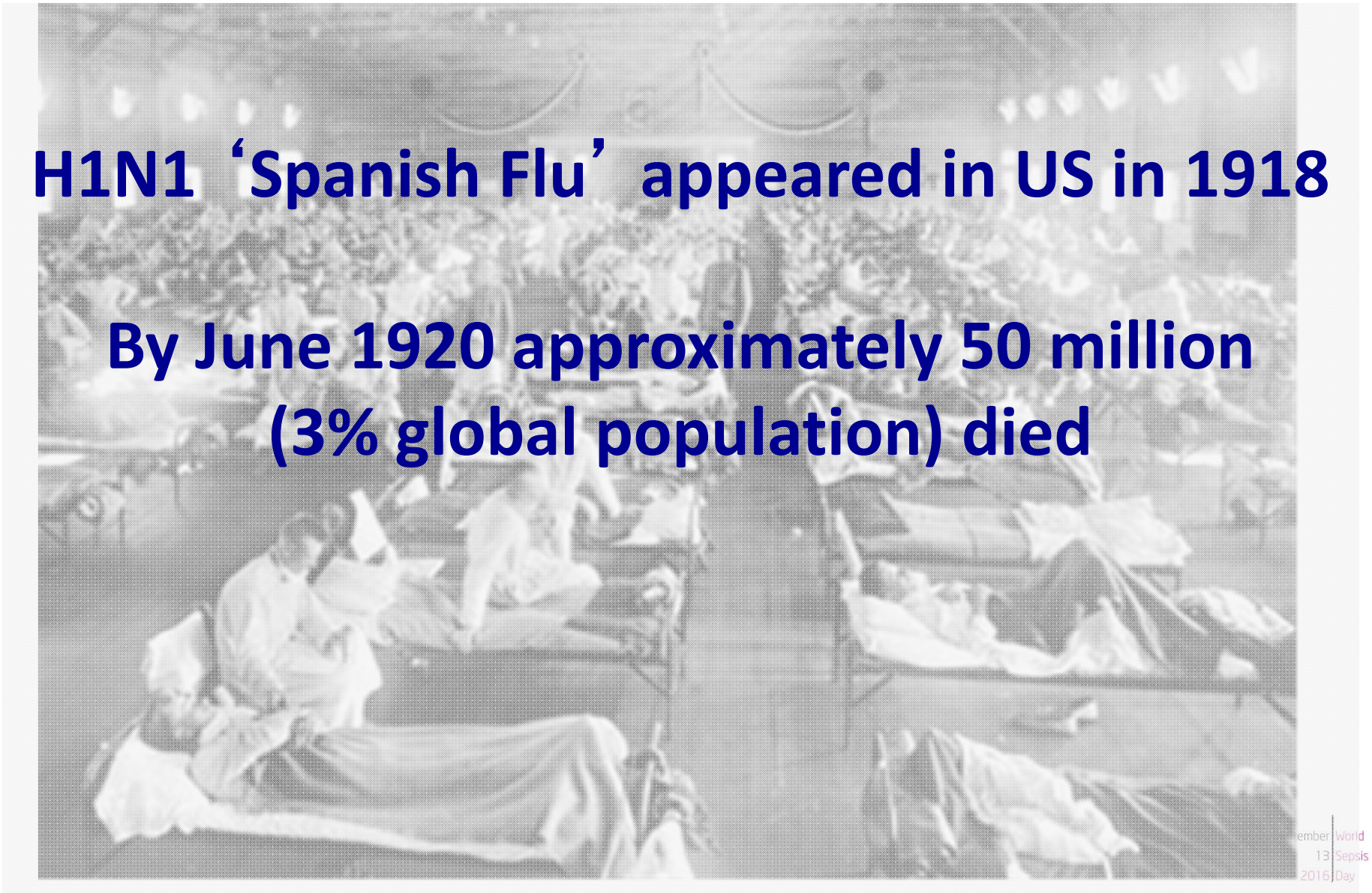


	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
All others	13.7%	13.0%	12.5%	12.0%	11.3%	10.8%	10.2%	10.0%	9.7%	9.4%	8.9%	8.7%	8.0%
Sepsis	35.0%	33.6%	31.2%	30.1%	28.9%	26.2%	25.7%	24.5%	23.9%	22.0%	21.0%	19.8%	18.4%

Crude mortality in severe sepsis/septic shock patients and in all other intensive care unit (ICU) patients.

H1N1, *1918*

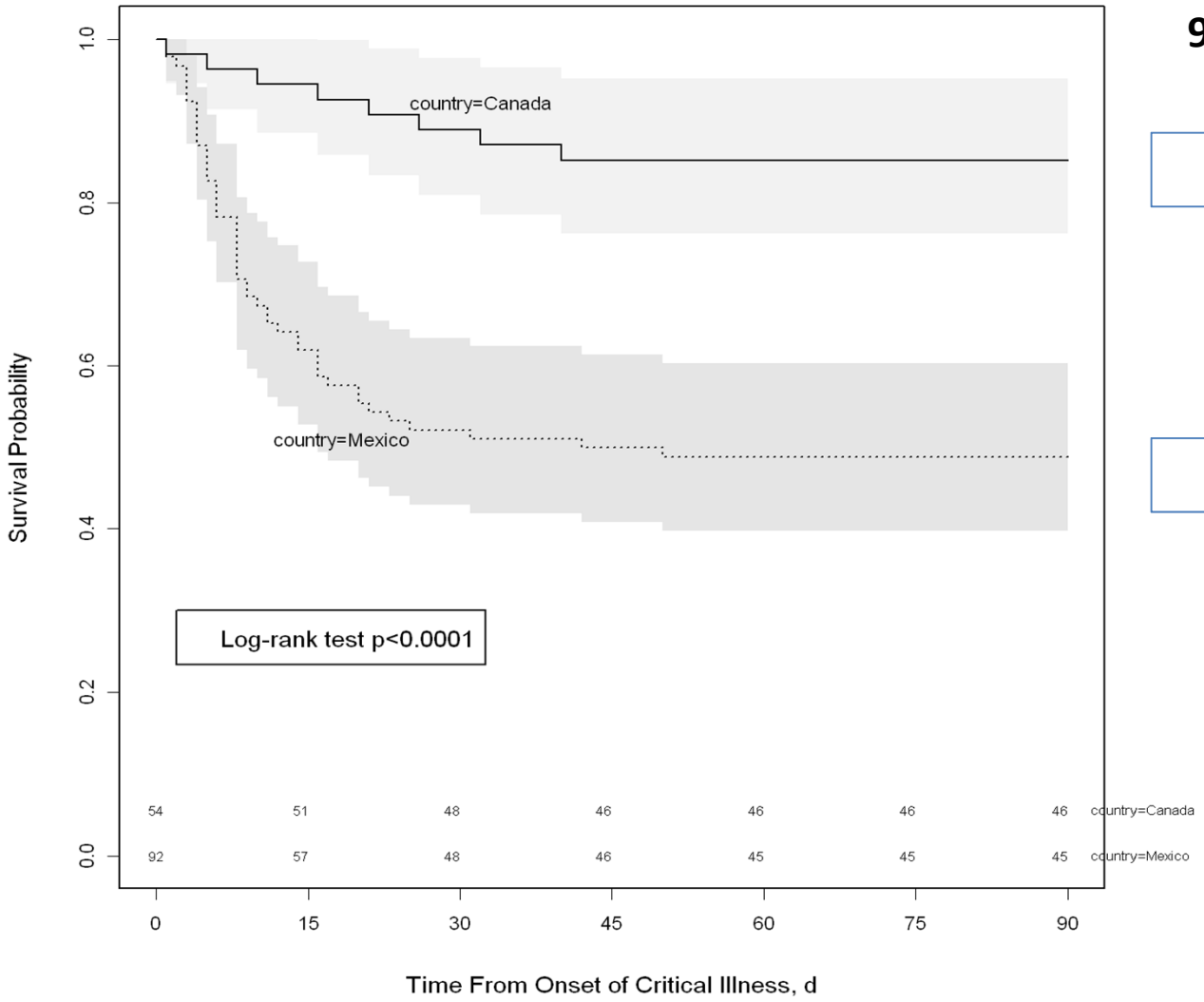


H1N1 'Spanish Flu' appeared in US in 1918

By June 1920 approximately 50 million (3% global population) died

ember World
13 Sepsis
2016 Day

H1N1 Clinical Outcomes - *2014*



90-day Mortality

14% Canada

50% Mexico

Domiguez-Cherit G, et al *Critical Care Medicine* 2016

Change in community acquired sepsis mortality between 2011 and 2013

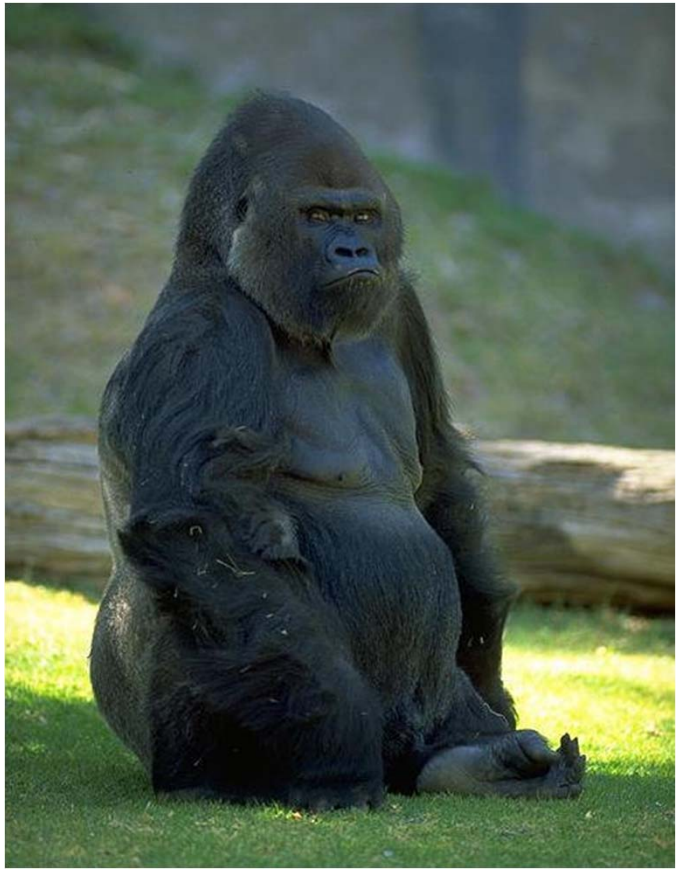
stop sepsis save lives

60 day mortality Rivers 2001:
Control 56.9% EGDT 44.3%

60 day mortality ProCESS 2014:
Control 18.1%/18. 9% EGDT 21%

90 day mortality ARISE 2014:
Control 18.6% EGDT 18.8%

Fortschritt durch Ablösung der eminenz- durch die evidenz-basierte Medizin



David Sackett

Ursachen für die niedrige Krankenhaus-sterblichkeit um 20% in ProCESS u. ARISE

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- Früherkennung und -Therapie in **allen** Gruppen
- 70% der Patienten hatten 3 Std. nach Eintreffen im Krankenhaus eine Antibiose
- Alle Patienten hatte bereits vor Einschluss mehr als 2L Volumenersatz und 6.5- 8 L innerhalb der ersten 72 Std.
- Nur Kristalloide
- Lungenprotektive Beatmung in allen Gruppen
- Niedriger Hb < 7g/dl als Transfusionstrigger

EBM und ihre Implementierung als Hauptursachen für die Fortschritte in der Intensivmedizin

- Vermeidung von „iatrogener“ Schädigungen
- Früherkennung lebensbedrohlicher Zustände
- Vermeidung von Schmerz und Schmerzmanagement
- Vermeidung von Delir und Delirmanagement
- Frühmobilisierung und Exercise

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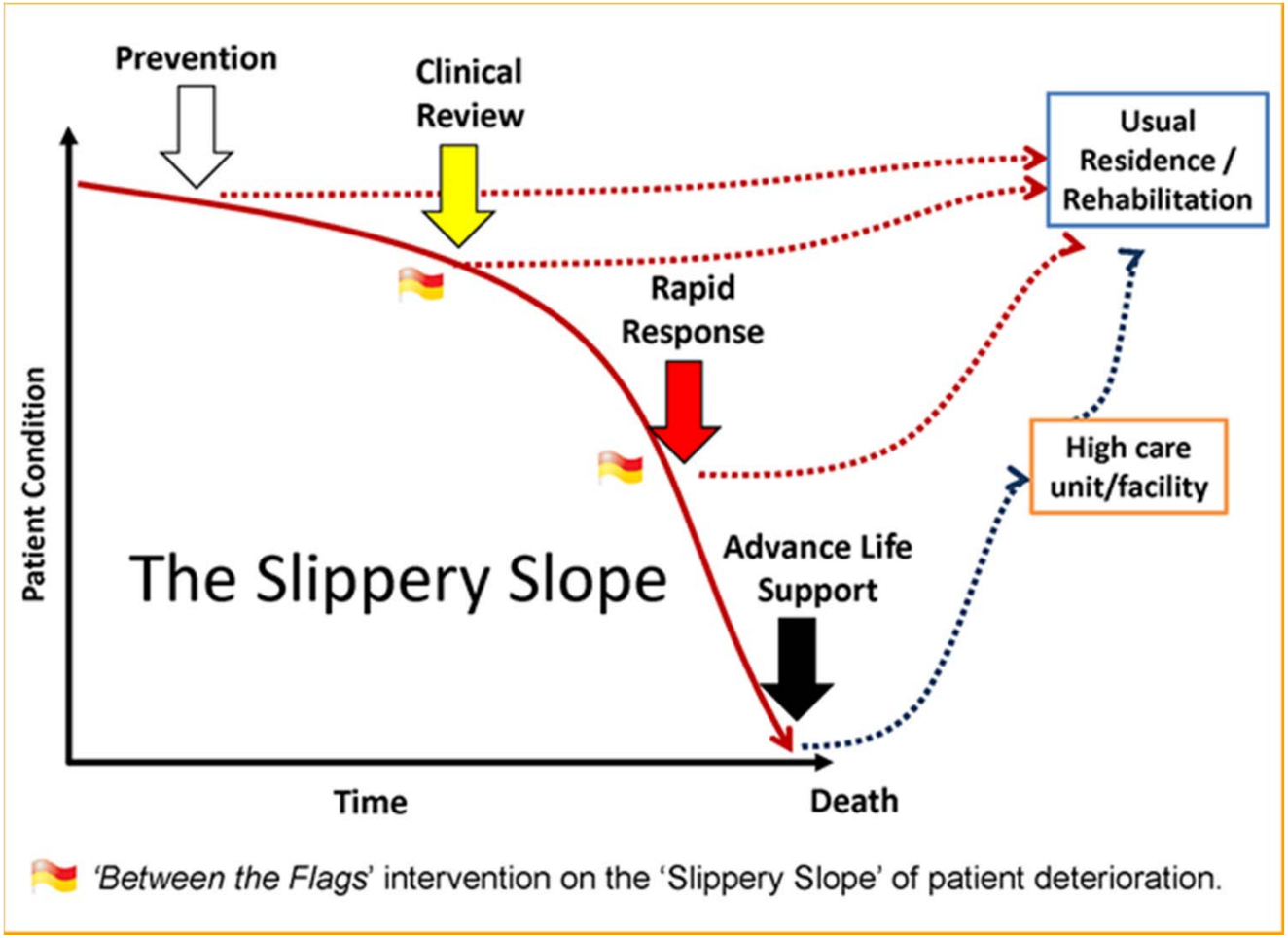
CLINICAL EXCELLENCE COMMISSION

Peter Safar - 1974

"The most sophisticated intensive care often becomes unnecessarily expensive terminal care when the pre-ICU system fails"

Early Detection of Patients and care by Rapid Response Teams



http://www.cec.health.nsw.gov.au/programs/between-the-flags

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A systems approach to the early recognition and rapid administration of best practice therapy in sepsis and s c shock

Duane Funk[a,b], Frank Sebat[c] and Anand Kumar[a,d]

Critical care without boundaries

- Rapid recognition and administrati ples could be done outside critical care
- Critical care was a “ not just a “place”
- System requi ions, structure, education, and impler

Funk et al., *Curr Opin Crit Care* 15:2009

Bedeutung der Versorgungsforschung- von der Evidence zur Implementierung

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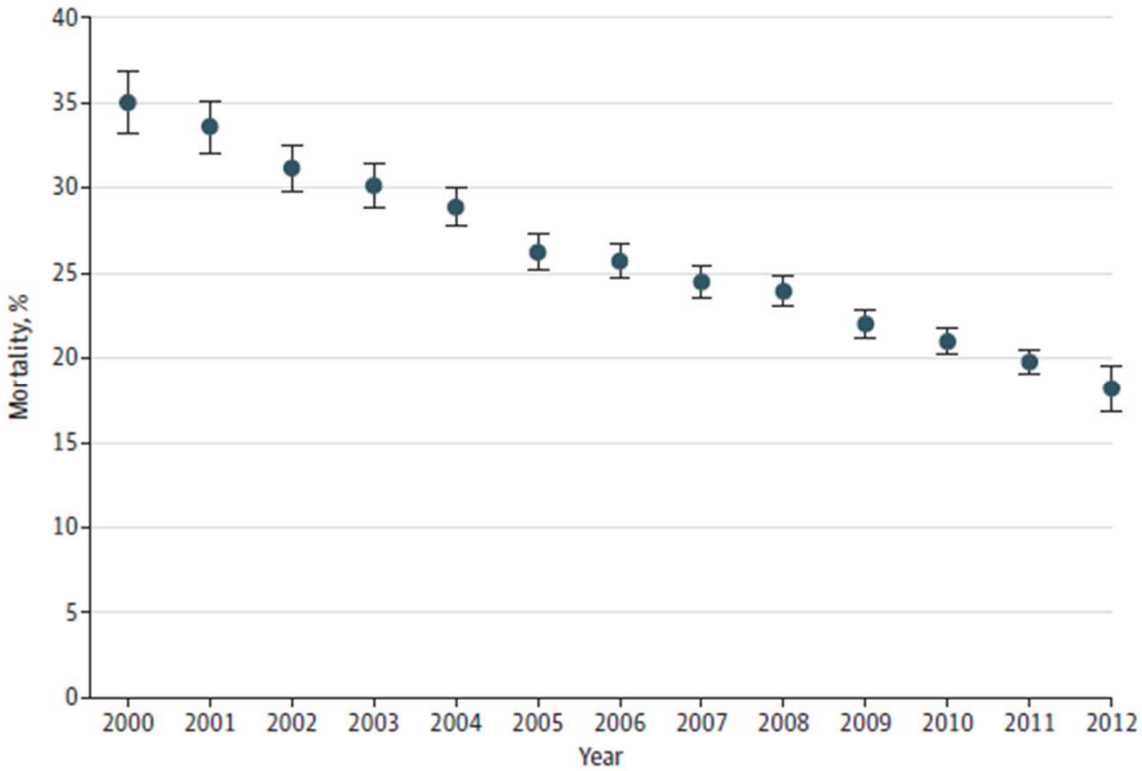
Figure 1. Mean Annual Mortality in Patients With Severe Sepsis



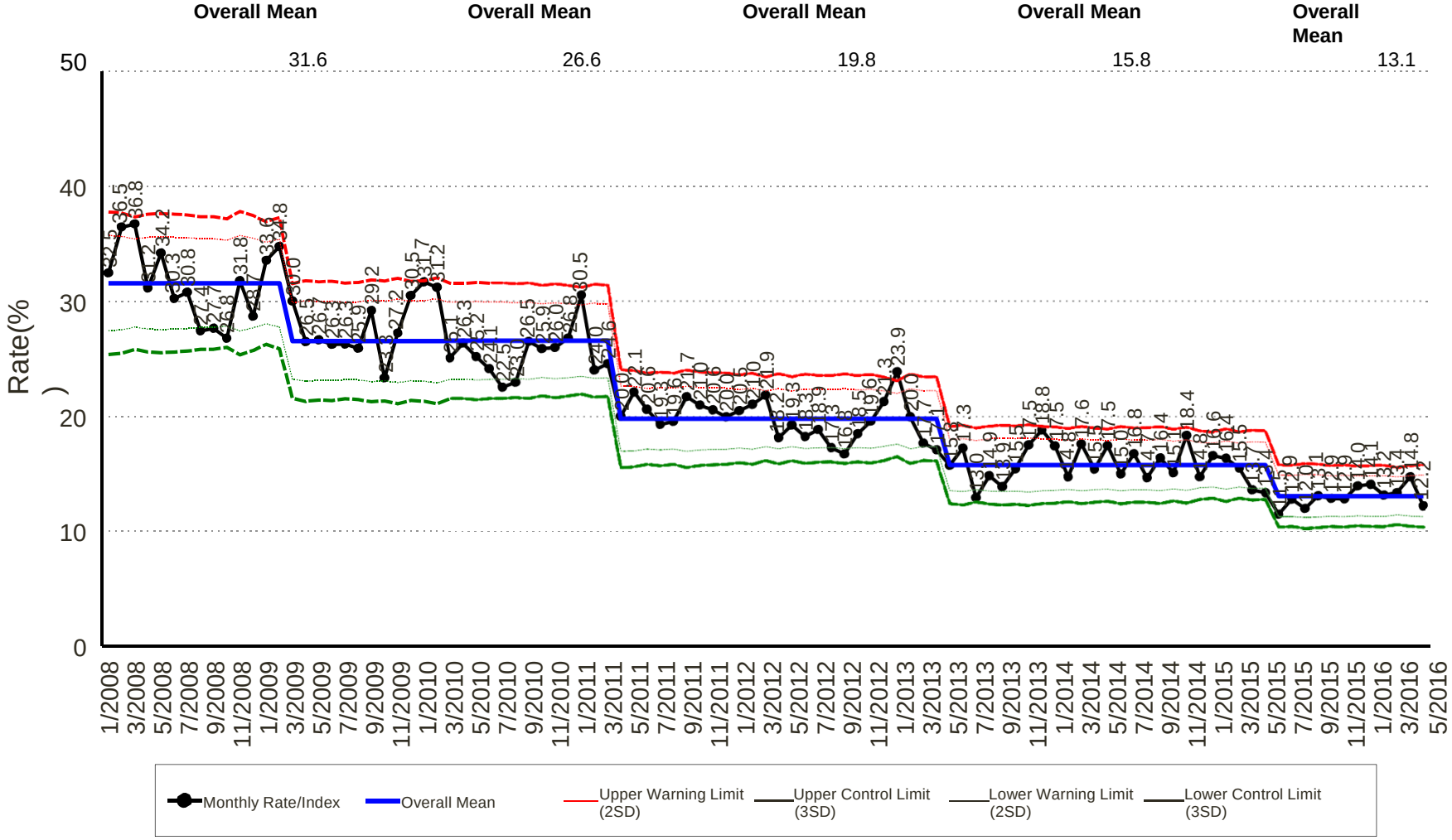
No. of patients	2708	3783	4668	5221	6375	6987	7627	8529	8797	10 277	11 367	12 213	12 512

JAMA 2015

Northwell Health

Raw Sepsis and Severe Sepsis/Septic Shock Mortality Rate

January 2008 - May 2016



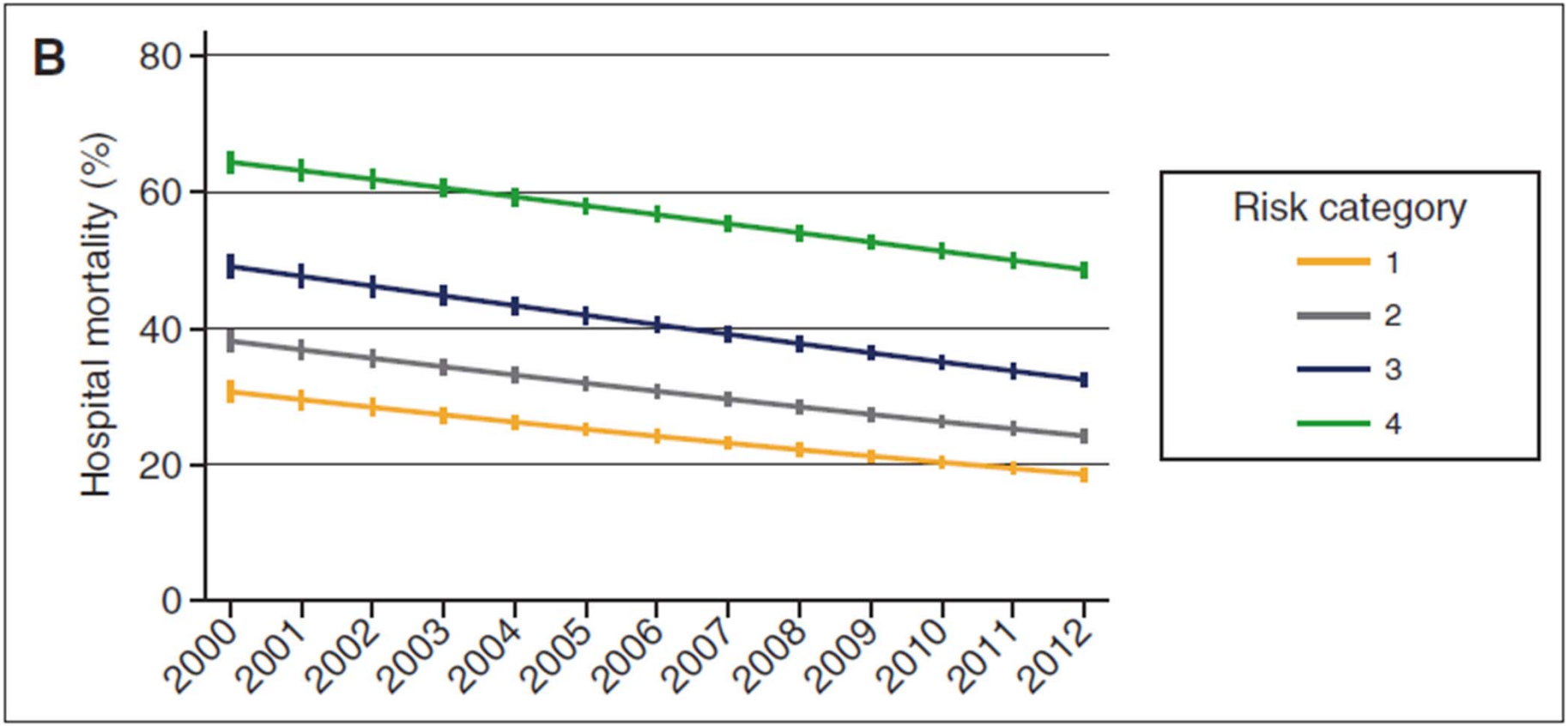
Note: Sepsis and Severe Sepsis/Septic Shock discharges based on the following secondary ICD-9 codes: 99591 (Sepsis). 99592 (Severe Sepsis). 78552 (Septic Shock) is a subset of 99592 and is included in this report. The following ICD-10 codes for Sepsis, Severe Sepsis and Septic Shock are included after 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

Course of hospital mortality of ICU treated sepsis patients between 2000-2012 in UK



Manu Shankar-Hari et al CCM 2016

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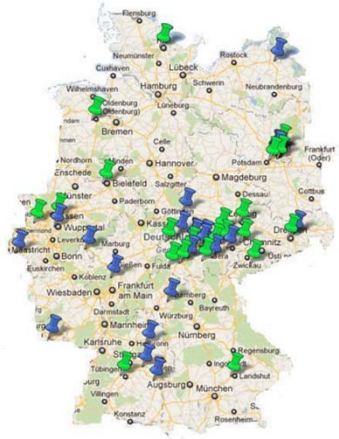
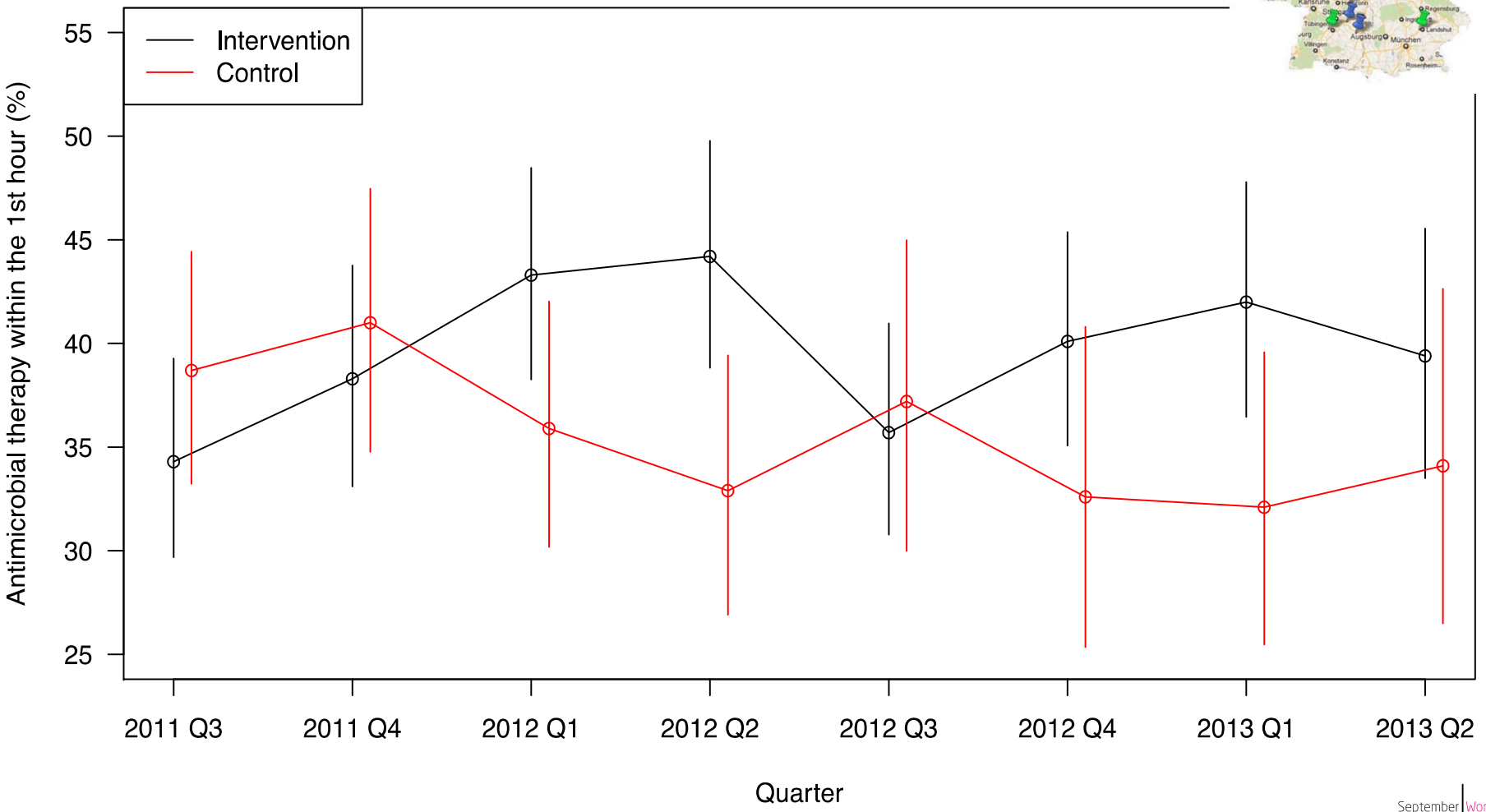
In Deutschland ist die Sepsissterblichkeit hoch und hat sich kaum verbessert

- Australien: 2000-2012 ⬇ 35% auf 18.5%
- England: 2000-2012 ⬇ 45.5% auf 32.1%
- USA: 2003-2007 ⬇ 37 % auf 29%
- Deutschland: 2003-2013 ⬇ 47,8% auf 43,6%

Outcomes: Antimicrobial Therapy within 1st Hour





Barriers to Change in the MEDUSA Trial

- Lack of awareness and support by hospital board
- Lack of involvement of the whole institution and across all health care professions
- Failure to involve leadership of other departments (ED, surgery, internal medicine, microbiology and pharmacy)
- Lacking time resources for QI change teams
- General staff shortage

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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

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

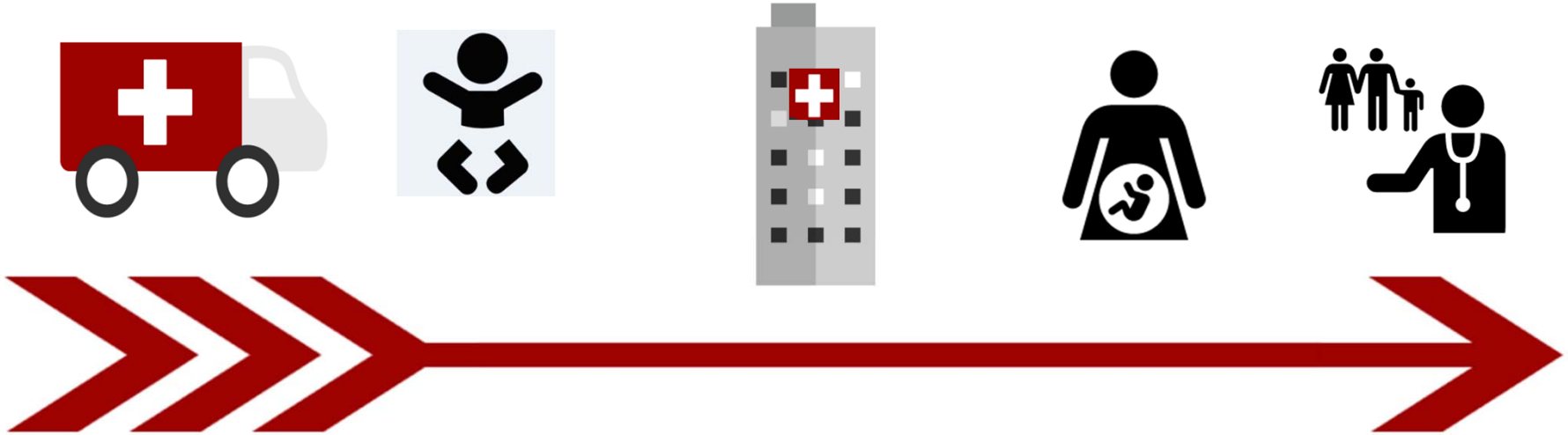
REFER:

To specialist care and initiate retrieval if needed

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

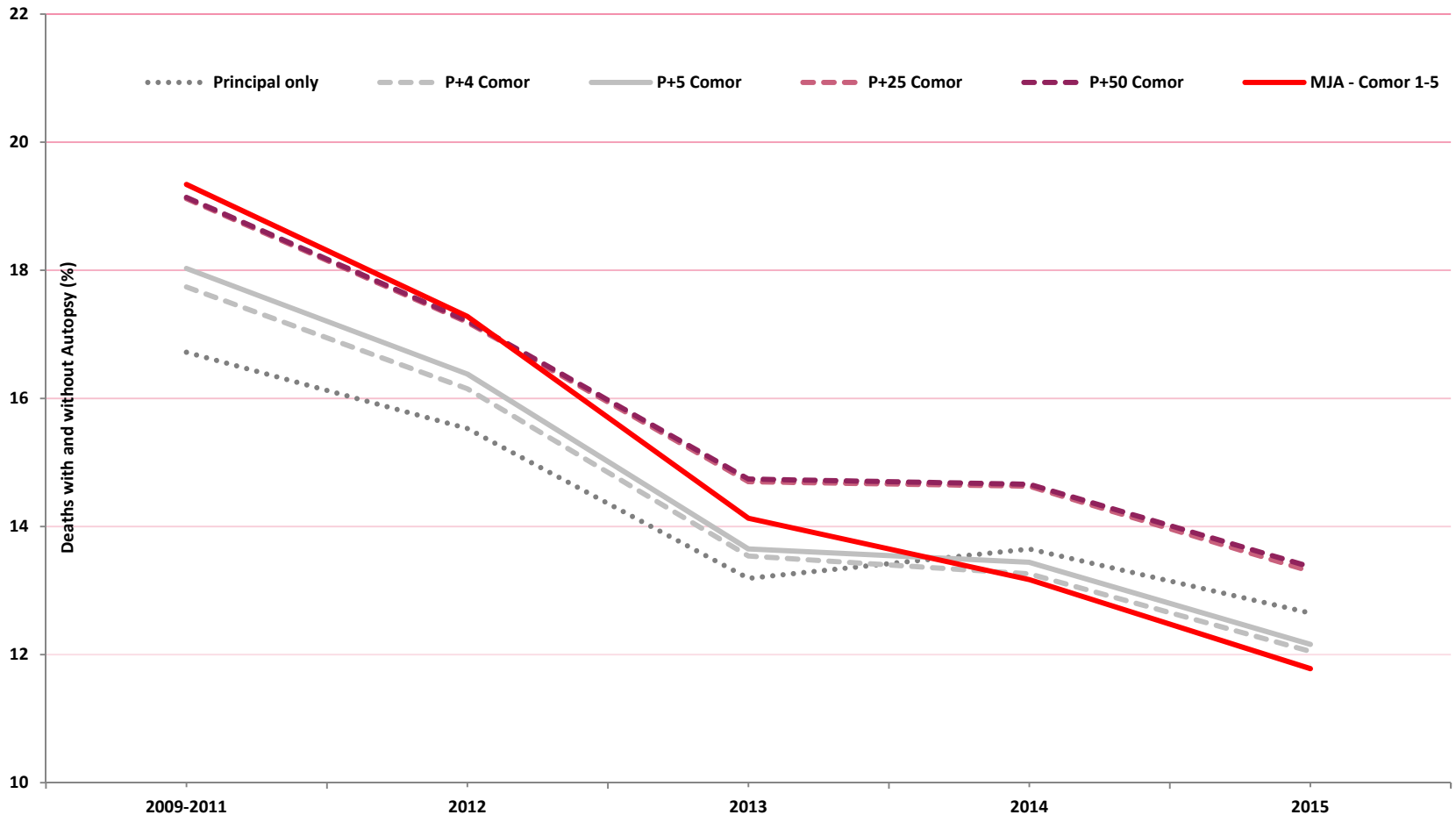
R. Phillip Dellinger, MD[1]; Mitchell M. Levy, MD[2]; Andrew Rhodes, MB BS[3]; Djillali Annane, MD[4]; Herwig Gerlach, MD, PhD[5]; Steven M. Opal, MD[6]; Jonathan E. Sevransky, MD[7]; Charles L. Sprung, MD[8]; Ivor S. Douglas, MD[9]; Roman Jaeschke, MD[10]; Tiffany M. Osborn, MD, MPH[11]; Mark E. Nunnally,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

SEPSIS KILLS timeline



2011	2013	2014	2015	2016
Adult Emergency Departments	Paediatric Emergency Departments	Adult and Paediatric inpatient wards	Maternal and Newborn pathways	Adult and Paediatric pathways revised

NSW hospital sepsis mortality



In etlichen Ländern droht eine Ära der postfaktischen Politik

The NEW ENGLAND JOURNAL of MEDICINE

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ORIGINAL ARTICLE

Intensive Insulin Therapy and Pentastarch Resuscitation in Severe Sepsis

The NEW ENGLAND JOURNAL of MEDICINE

ORIGINAL ARTICLE

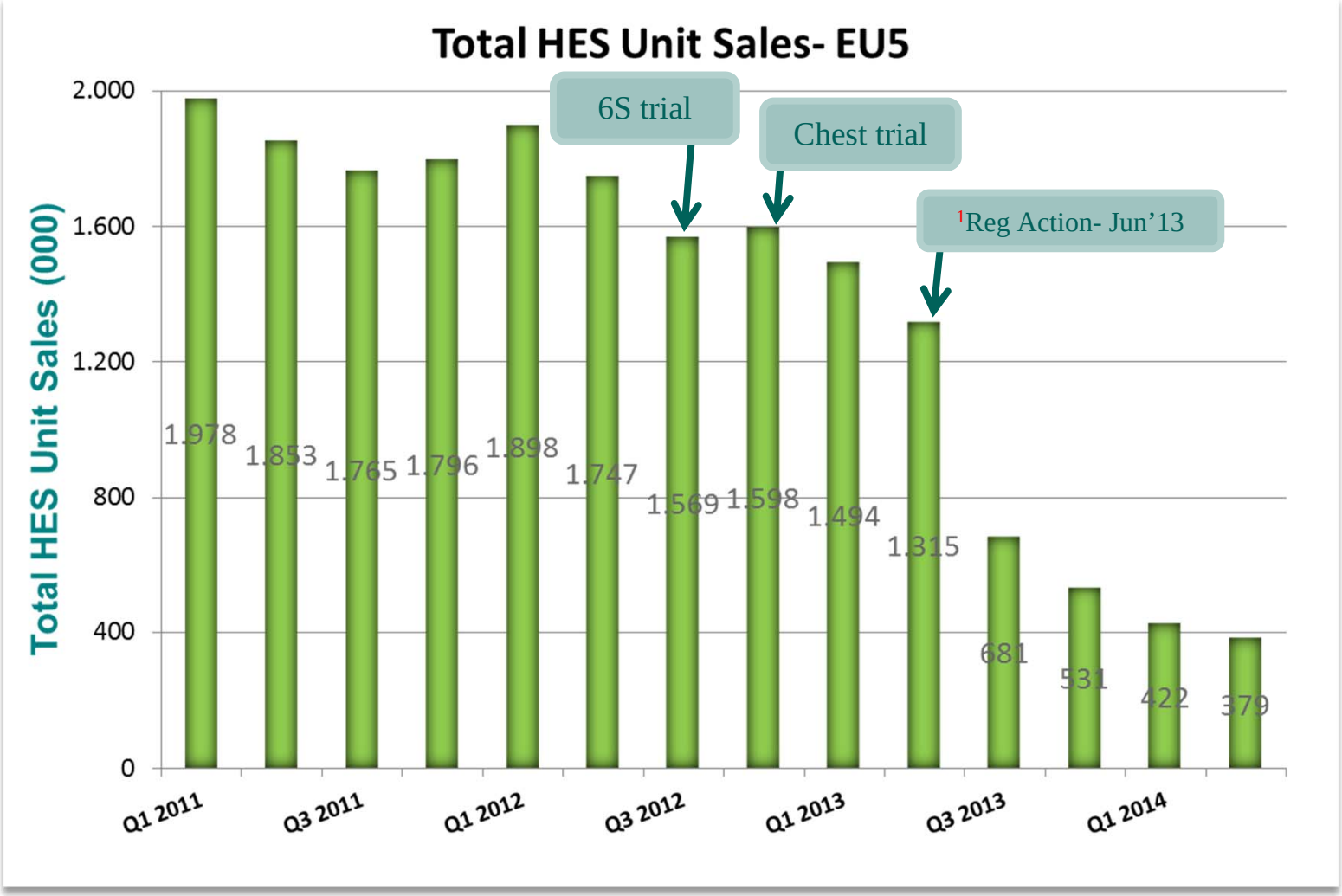
Hydroxyethyl Starch 130/0.4 versus Ringer's Acetate in Severe Sepsis

The NEW ENGLAND JOURNAL of MEDICINE

ORIGINAL ARTICLE

Hydroxyethyl Starch or Saline for Fluid Resuscitation in Intensive Care

HES- Sales Analysis- EU5

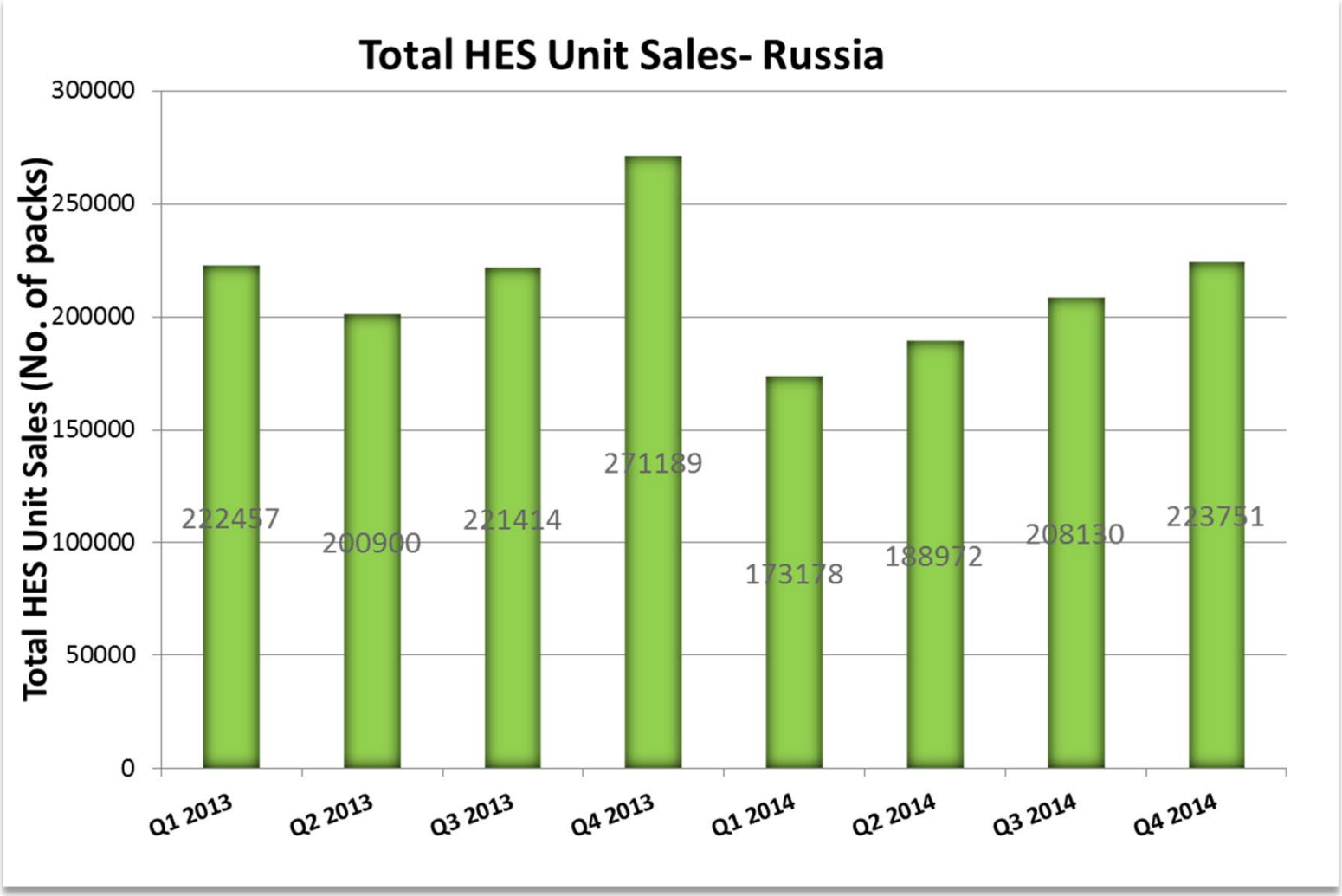


Note: Total HES Sales irrespective of bottle size and %

[1]Reg- Regulatory

Source: IMS Colloids Q2 2014 Data

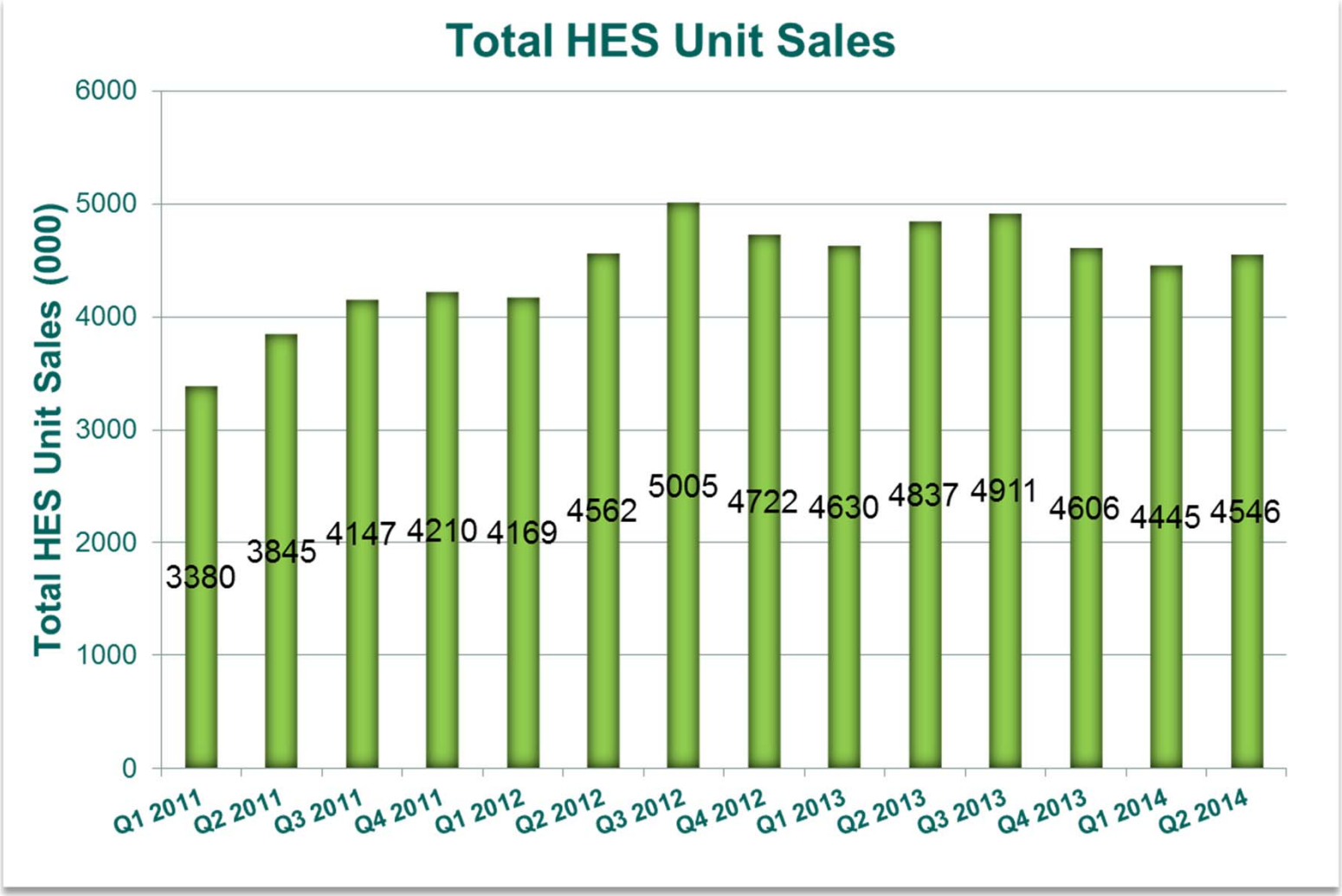
HES- Unit Sales Analysis- Russia



Note: Units - # of Packs Sold

Source: IMS Colloids Q4 2014 (Mar 2015)

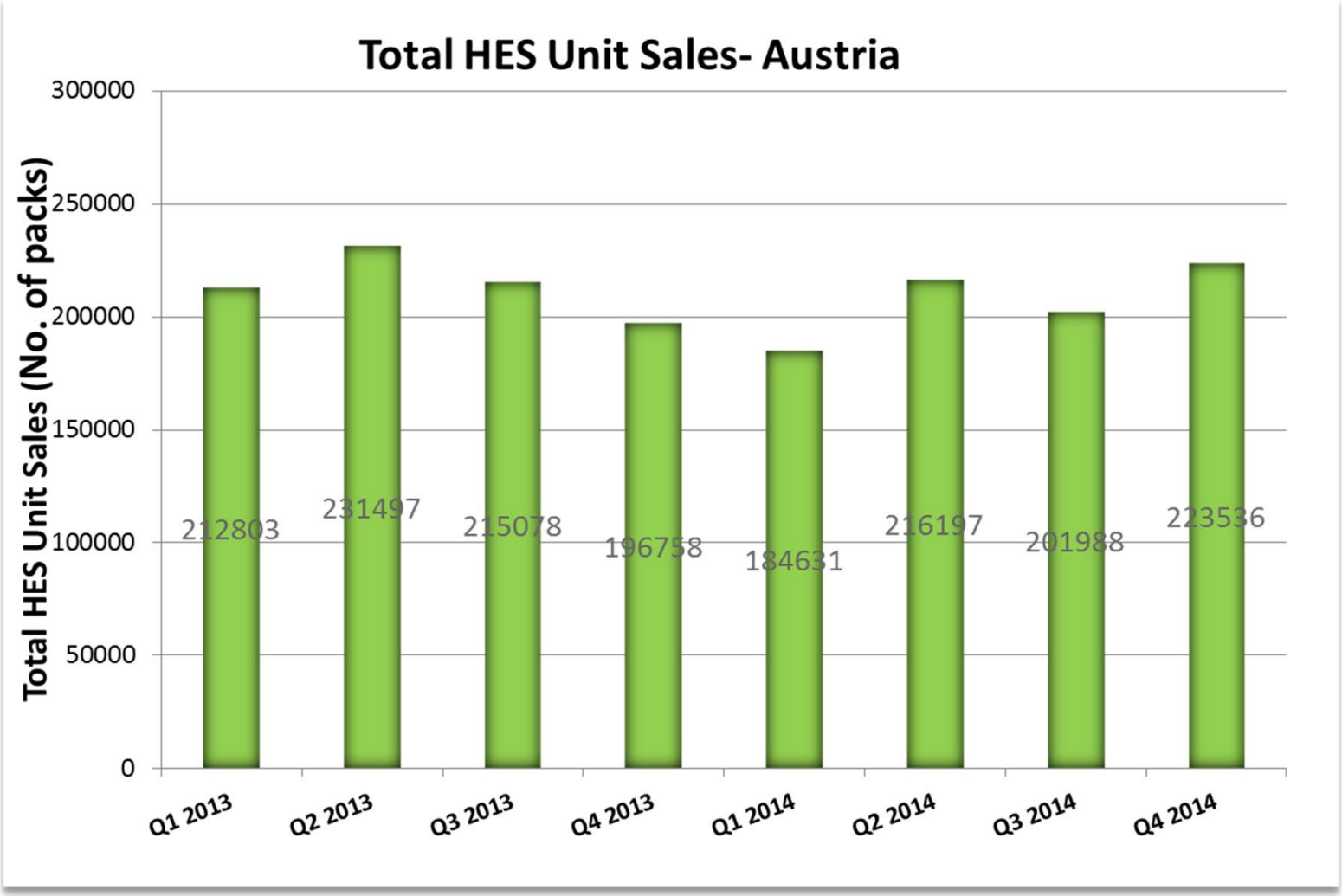
HES- Sales Analysis- China



Note: Total HES Sales irrespective of bottle size and %

Source: IMS Colloids Q2 2014 Data

HES- Unit Sales Analysis- Austria



Note: Units - # of Packs Sold

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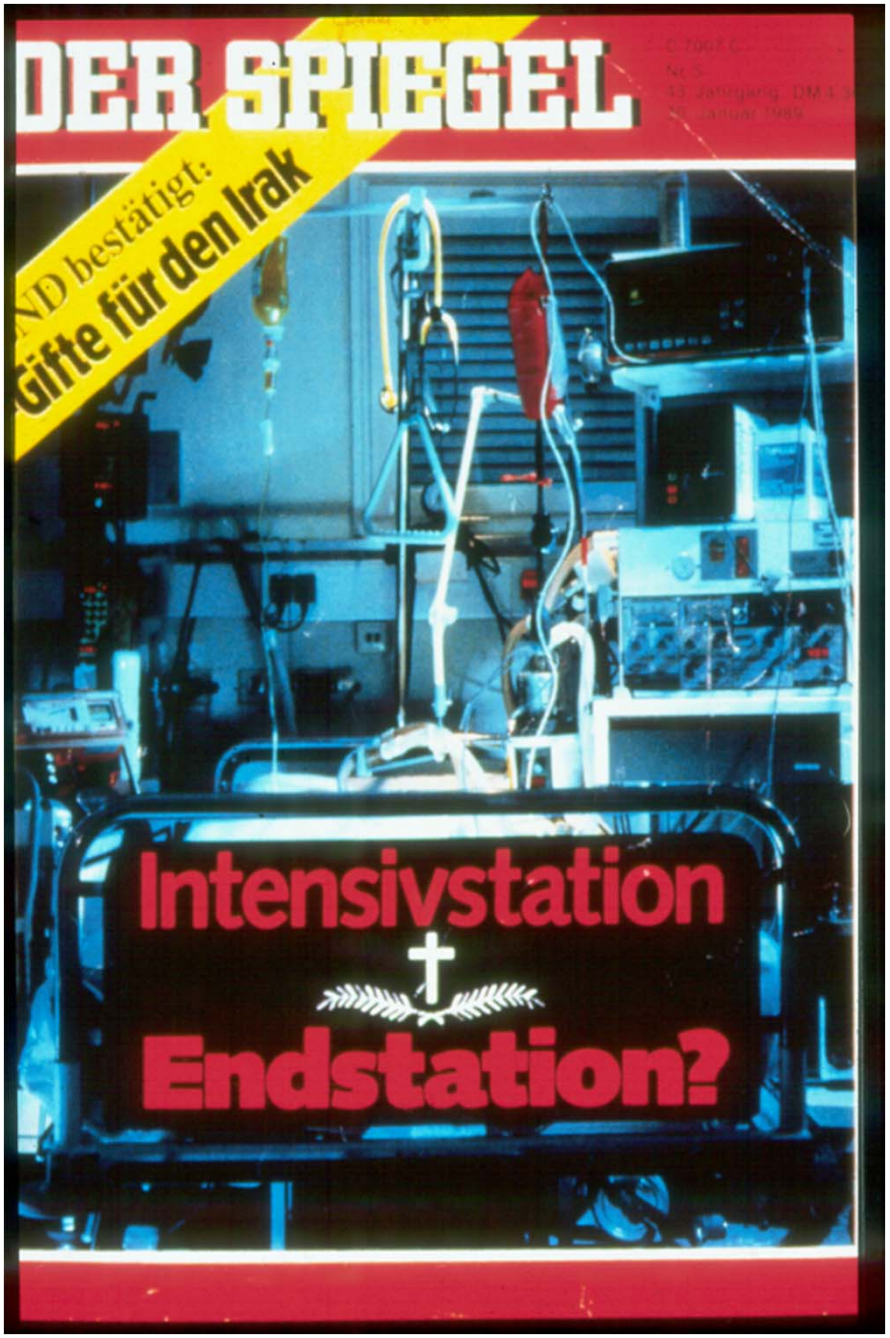

stop
sepsis
save
lives

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stop
sepsis
save
lives

Intensivstationen als Tatorte einer seelenlosen Medizin, wo hilflose Menschen der Willkür technikgläubiger Ärzte ausgeliefert sind.

Tod in den USA

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- 90% der befragten Amerikaner wünschen zu Hause zu sterben
- Nur ca. 20% der Amerikaner werden zu Hause sterben
- Etwa 20-30% werden einen ICU Aufenthalt vor dem Tod haben

The boatman Charon, gatekeeper of the river Styx, takes the condemned souls to Hell's Mouth. Painting of the Last Judgment by Michelangelo (Sistine Chapel 1536-41)

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Isle of the Dead (German: Die Toteninsel) painting of Swiss artist Arnold Böcklin (1880).

The NEW ENGLAND JOURNAL of MEDICINE

REVIEW ARTICLE

CRITICAL CARE MEDICINE

Simon R. Finfer, M.D., and Jean-Louis Vincent, M.D., Ph.D., *Editors*

Dying with Dignity in the Intensive Care Unit

Deborah Cook, M.D., and Graeme Rocker, D.M.

THE TRADITIONAL GOALS OF INTENSIVE CARE ARE TO REDUCE THE morbidity and mortality associated with critical illness, maintain organ function, and restore health. Despite technological advances, death in the intensive care unit (ICU) remains commonplace. Death rates vary widely within and among countries and are influenced by many factors.[1] Comparative international data are lacking, but an estimated one in five deaths in the United States occurs in a critical care bed.[2]

When Acute Illness Becomes Chronic Illness

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Epidemiology of Severe Sepsis*

A retrospective, population-based, observational study of data for ICU admission in Australia and New Zealand from the Australian and New Zealand Intensive Care Society Adult Patient Database.
1,028,235 critically ill patients from 182 ICUs between Jan 2000 and Dec 2014 were enrolled

Cases of Persistent Illness

5.0% (51,509)
ICU patients

32.8%
(1,029,345/3,138,432)
ICU bed-days

14.7%
(2,197,108/14,961,693)
hospital bed-days

24.5%
(12,625/51,509)
deaths

46.5%
(23,968/51,509)
discharged home

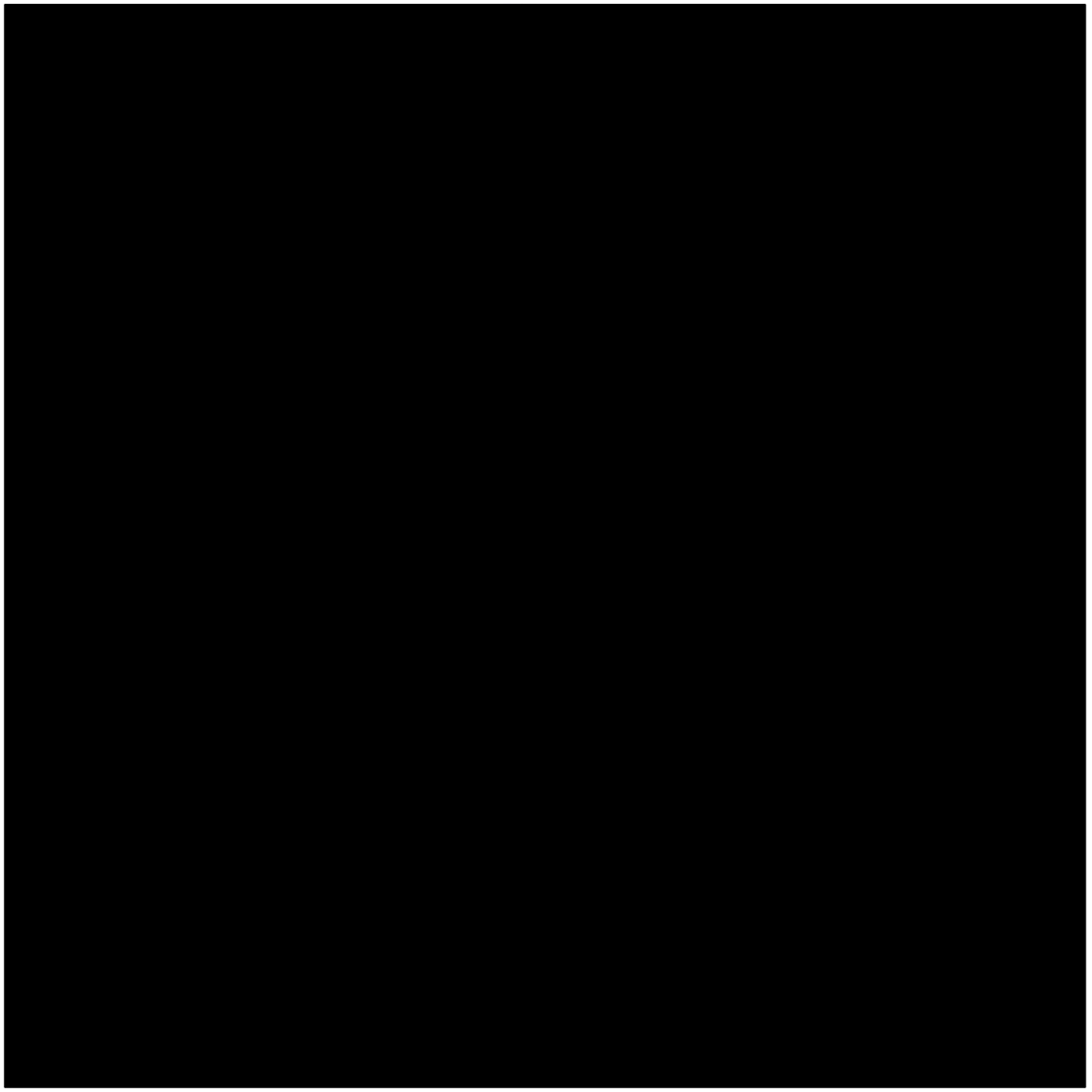
Iwashyna T, Hodgson CL, Pilcher D, et al. Timing of onset and burden of persistent critical illness in Australia and New Zealand: a retrospective, population-based, observational study. Lancet Respir Med 2016

Creative Destruction

Joseph Schumpeter:popularized the term“Creative Destruction”

Transformation that accompanies radical innovation

Creative Destruction: Nokia



Creative Destruction: Health Care

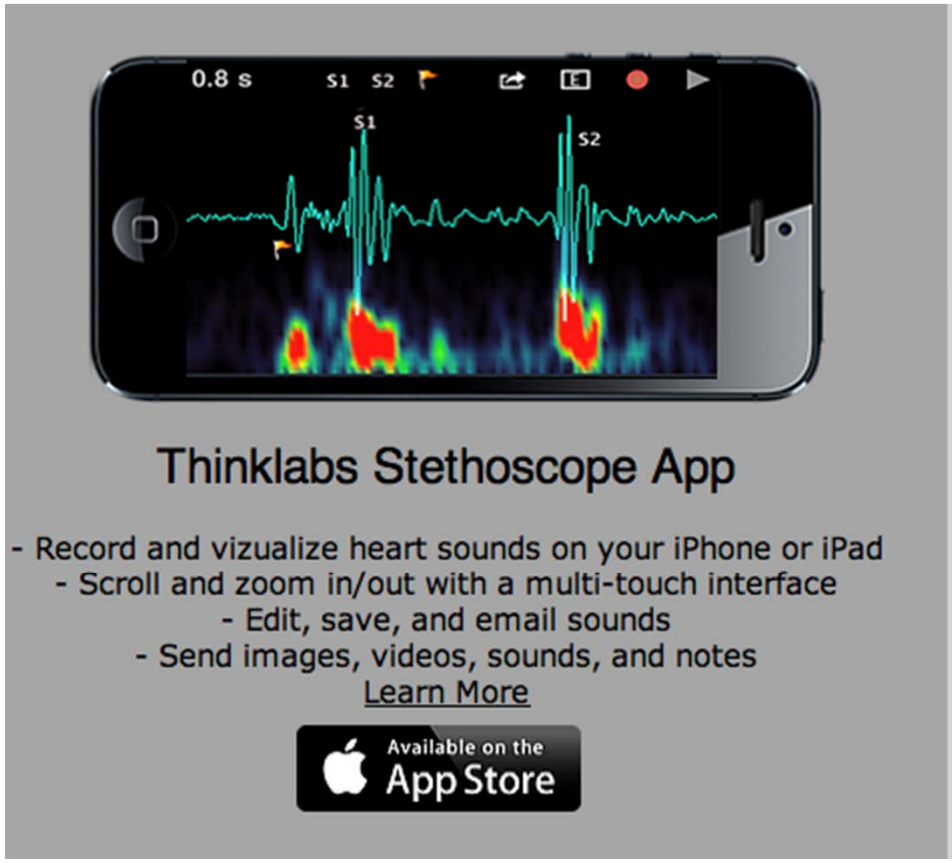
Time for Disrupting the Undisrupted.

Invented in 1816. Has not changed much since 1940.

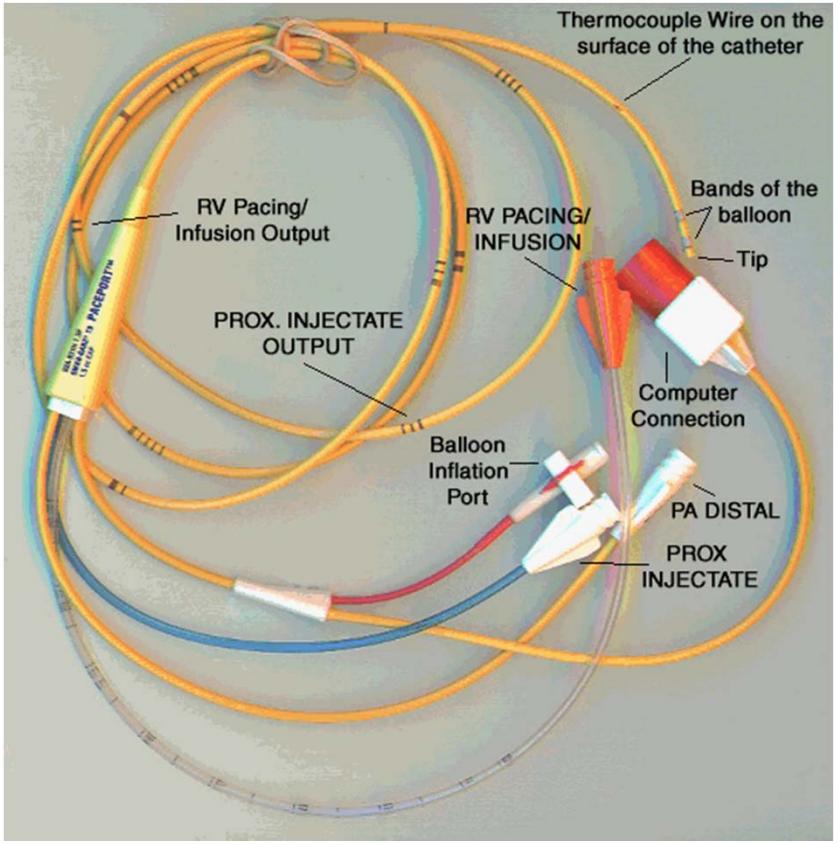
Creative Destruction: iStethoscope?

Creative Destruction: Digital Revolution

iMURMU

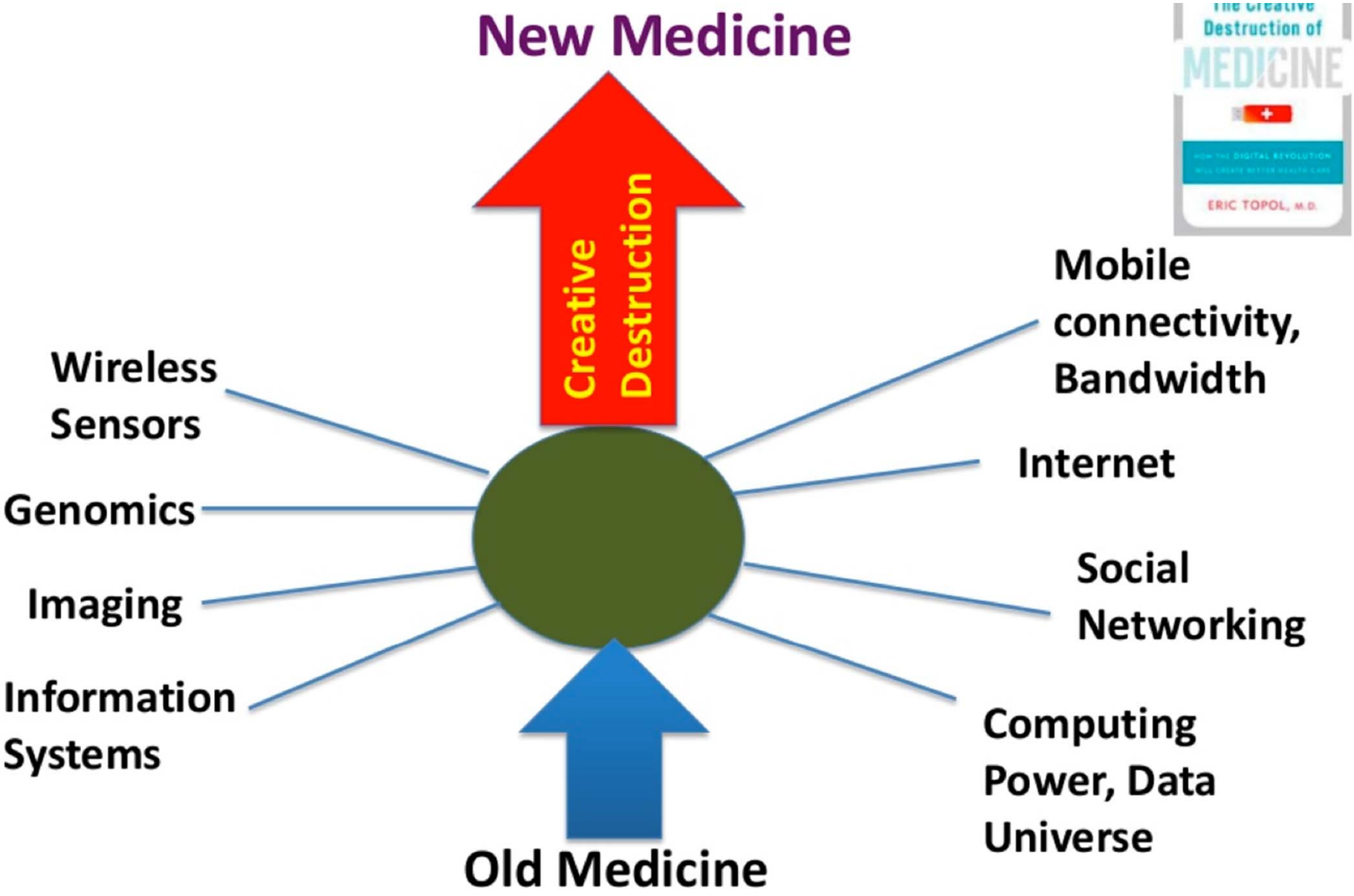


Swan Ganz Catheter



Less invasive approaches,
Bed side ultrasound,
echocardiography

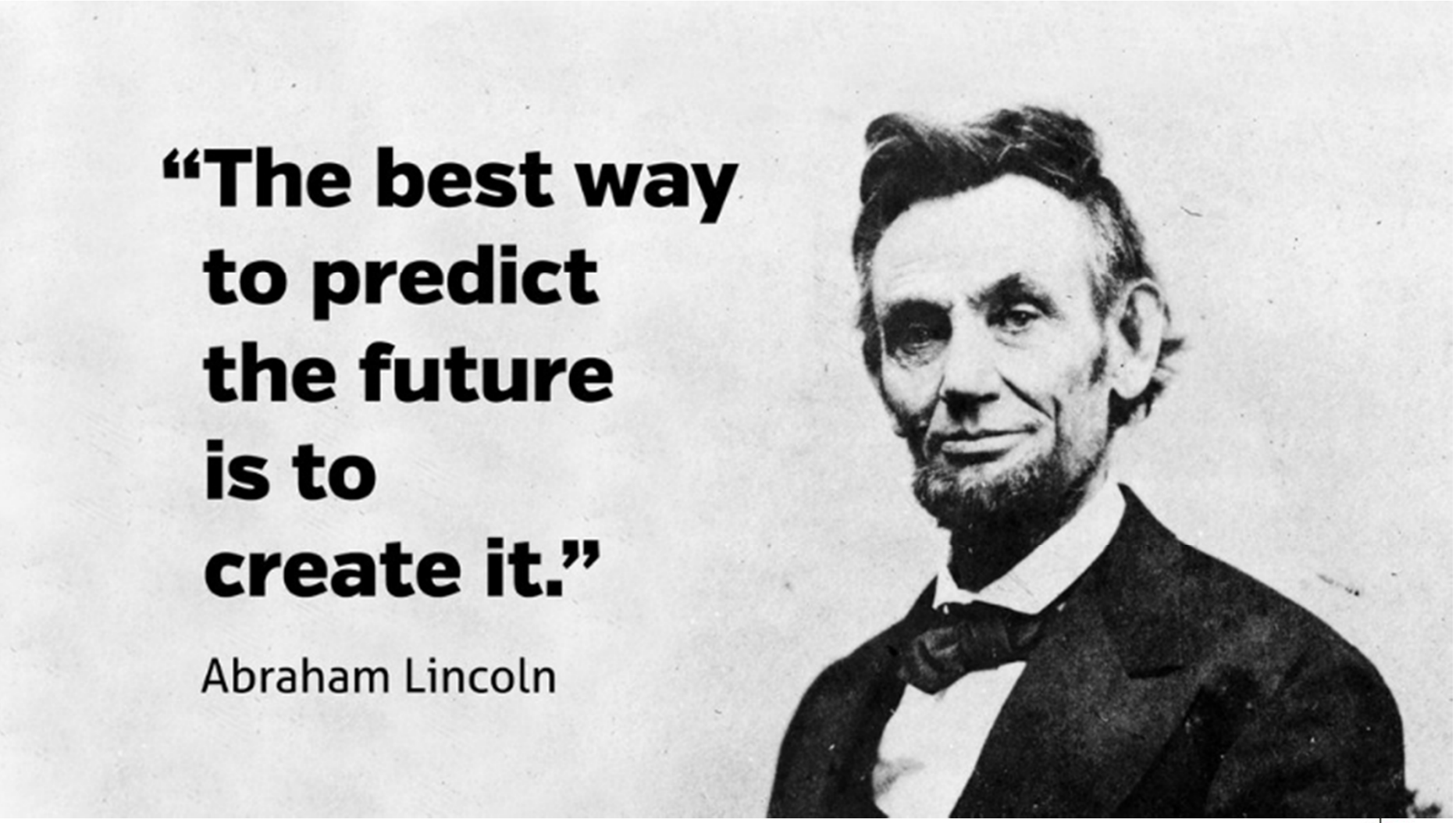
Creative Destruction of Medicine



Homo-sapiens vs Homo-digitus

Until recently, you were a folder.

Conclusion


"The best way
to predict
the future
is to
create it."
Abraham Lincoln

"HOW WONDERFUL IT IS THAT
NOBODY NEED WAIT
A SINGLE MINUTE BEFORE STARTING TO
IMPROVE
THE WORLD"
Anne Frank