2026 California Thoracic Society Annual Educational Conference

& Chronic Obstructive Pulmonary Disease Symposium

Thursday March 12, 2026-Sunday March 15, 2026

Earn up to 19 CME/CEU/MOC Credits

Jointly Provided by AKH Inc., Advancing Knowledge in Healthcare and the California Thoracic Society

PORTOLA HOTEL & SPA
AT MONTEREY BAY

Thursday March 12, 2026 (6 CME/CEU/MOC Credits)
COPD Symposium
Friday March 13, 2026 (6.5 CME/CEU/MOC Credits):
Advances in Interventional Pulmonary, Remote Monitoring in Pulmonary and Sleep Medicine, Approach to Symptom Management in Chronic Lung Disease and Critical Care
Saturday March 14, 2026 (6.5 CME/CEU/MOC Credits)
Sepsis and Shock, Extracorporeal Membrane Oxygenation, Inpatient Pulmonary Complications of Cancer Care
Sunday March 15, 2026
Fellow and Resident Track Symposium

California Thoracic Society
ATS Chapter Serving California and Arizona

AKH INC.
ADVANCING KNOWLEDGE IN HEALTHCARE

California Thoracic Society
Annual Conference
March 12-15, 2026
Portola Hotel and Spa, Monterey, CA

Saturday March 14, 2026

Advances in Management of the Patient with Sepsis

8:00 am – 8:10 am: Welcome and Introduction

8:10 am – 8:55 am: Keynote Address – Phenotyping and Personalized Medicine in Sepsis

- **Angela Rogers, MD (Stanford)** - This speaker will discuss phenotyping in the patient with sepsis and septic shock and how close we are to precision medicine in managing sepsis.

8:55 am – 9:20 am: Incorporating Artificial Intelligence Decision Making in Identifying Sepsis

- **Gabriel Wardi, MD (UC San Diego)** - This speaker will describe how artificial intelligence can be used to identify the septic patient before they present with end stage symptoms to impact care earlier in the course of illness.

9:20 pm – 9:35 pm: Pro: The Severe Sepsis and Septic Shock Early Management Bundle (SEP-1) Bundle Saves Lives

- **Sean Townsend, MD (CPMC-Sutter)**- This speaker will argue the benefits of the SEP-1 Bundle/how it saves lives.

9:35 pm – 9:50 pm: Con: : The Severe Sepsis and Septic Shock Early Management Bundle (SEP-1) Bundle Does Not Save Lives

- **Natalie Achamallah, MD, MS (Cottage Health)** - This speaker will argue the against the SEP-1 Bundle/highlight its limitations.

9:50-10:00 am Question and Answer

10:00 am – 10:30 am: Break

Extracorporeal Membrane Oxygenation

10:30 am – 10:55 am: When to refer to an ECMO center and when to deploy ECMO

- **Nida Qadir, MD (UC Los Angeles)** - This speaker will discuss the evidence behind the use of ECMO in patients with respiratory failure and when providers should consider referral to an ECMO center and when centers should use ECMO.

10:55 am – 11:20 am: What about ECMO to go?

- **Mazen Odish, MD (UC San Diego)** - This speaker will discuss the advent of mobile ECMO services, how they can help improve patient care, and the use of extracorporeal cardiopulmonary resuscitation.

11:20 am – 11:45 pm: Ventilator Strategies for the patient on ECMO

- **Abirami Kumaresan, MD (Cedars-Sinai)** - This speaker will discuss the how ventilator strategies may differ in the patient on ECMO and how different ECMO configurations impact which ventilator strategy to use.

11:45 pm – 12:10 pm: What you need to know about pediatric ECMO

- **Kathleen Ryan, MD (Stanford)** - This speaker will discuss the utility of ECMO in neonates and children, and the complexities of management in children who needs mechanical support.

12:10 pm – 12:20 pm: Question and Answer

12:20 pm – 1:20 pm: Lunch

Hands-On Session:

1:20 pm – 2:20 pm: Non-Invasive Cardiac Output Monitors **Speaker Abirami Kumaresan, MD (Cedars-Sinai)** ECMO Machines **Mazen Odish, MD (UC San Diego)** ECMO Placement **David Gordon, DNP (UC San Francisco) & Brianna Zuckerman, NP (UC San Francisco)** Ventilator Settings and Portable ventilators **Joe Van Vleet, RT (UC Los Angeles) & Theresa Cantu, RT (Valley Children's)**

2:20 pm – 2:45 pm: Break

Inpatient and Pulmonary Complications of Cancer Care

2:45 pm – 3:10 pm: Pulmonary Complications of Hematopoietic Stem Cell Transplantation

- **Husham Sharifi, MD (Stanford)** - This speaker will discuss the pulmonary complications that arise after HCT, in particular the development of bronchiolitis obliterans syndrome and approaches to management.

3:10 pm – 3:35 pm: Pulmonary Vascular Complications of Malignancy

- **Naomi Habib, MD (Norton Thoracic Institute)**- This speaker will discuss the Pulmonary Vascular Disease complications of malignancy including PA sarcoma, pulmonary tumor thrombotic microangiopathy, and medications that can cause PAH.

3:35 pm – 4:00 pm: Drug induced Interstitial Lung Disease and Pneumonitis During Cancer Therapy

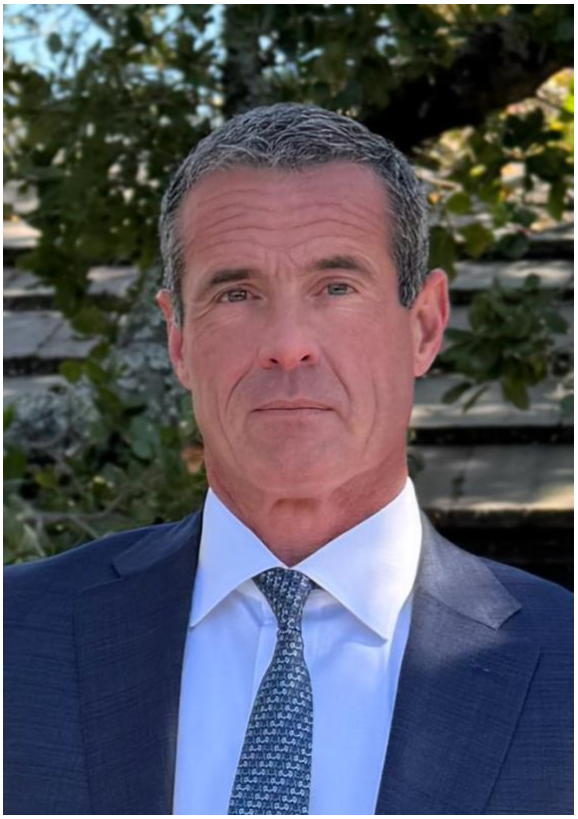
- **Weijia Chua, MD (Stanford)** - This speaker will discuss the pulmonary complications of interstitial lung disease and pneumonitis that develop after chemotherapy and targeted immunotherapy

4:00 pm – 4:25 pm: Respiratory Complications of Acute Leukemia

- **Hugh Davis, MD (City of Hope)** - The speaker will discuss various oncologic emergencies, how they are recognized, and how they are managed in the acute setting.

4:25 pm – 4:35 pm: Question and Answer

5:30 pm – 7:30 pm: Trainee Poster Competition (NON-CME) – Food and beverages will be served



Sean R. Townsend, M.D., is an healthcare executive in San Francisco. Dr. Townsend has served in variety of executive leadership roles that have defined his expertise. He was previously Chief Operating Officer and Vice President of Quality & Safety at Sutter Health's California Pacific Medical Center for 15 years. Dr. Townsend is board certified in critical care medicine and is a Clinical Associate Professor of Medicine at University of California, San Francisco. He is a nationally recognized leader in patient safety and quality improvement, a perennial faculty member at the Institute for Healthcare Improvement, and one of the seminal leaders of the Surviving Sepsis Campaign. Dr. Townsend is deeply interested in clinical quality measurement and guiding healthcare leaders and frontline professionals to embrace change using data to drive decisions. Presently he serves as measure steward for the Center for Medicare and Medicaid Service's first sepsis quality measure, SEP-1, and is advising CMS' effort to build 3 new electronic clinical quality measures: anticoagulant related major bleeding, post-operative DVT, and a new composite measure for hospital harm.

SEP-1 Pro: Compliance Matters

Sean R. Townsend, MD
California Pacific Medical Center, Sutter Health
Clinical Associate Professor
University of California San Francisco
March 14, 2026

Disclosures

- I have the following relationships with ACCME defined ineligible companies:
- **No relationships as above**
- I **WILL NOT** discuss off-label use and/or investigational use of any drugs or devices.

What are bundles?

Institute for Healthcare Improvement:

> "A bundle is a *structured way* of improving the processes of care and patient outcomes: a small, straightforward set of evidence-based practices — generally three to five — that, *when performed collectively and reliably*, have been proven to improve *patient outcomes*."

Resar R, Pronovost P, Haraden C, Simmonds T, et al. Using a bundle approach to improve ventilator care processes and reduce ventilator-associated pneumonia. Joint Commission Journal on Quality and Patient Safety. 2005;31(5):243-248.

Sepsis change bundles: Converting guidelines into meaningful change in behavior and clinical outcome

Mitchell M. Levy, MD; Peter J. Pronovost, MD, PhD; R. Phillip Dellinger, MD, FCCM; Sean Townsend, MD; Roger K. Resar, MD; Terry P. Clemmer, MD, FCCM; Graham Ramsay, MD

Figure 1. A clinician, now armed with a sepsis change bundle, attacks the three heads of sepsis (hypotension, hypoperfusion, and organ dysfunction). Inspired by *Hercules Kills Cerberus*, Renato Pettinato, 2001, in Zuccaro Palace, Agira, Sicily, Italy. Printed with the permission of the artist and the Rubolotta family.

"A clinician, now armed with a sepsis change bundle, attacks the three heads of sepsis (hypotension, hypoperfusion and organ dysfunction)."

2004

Levy MM, Pronovost PJ, Dellinger RP, Townsend S, Resar RK, Clemmer TP, Ramsay G. Sepsis change bundles: converting guidelines into meaningful change in behavior and clinical outcome. Crit Care Med. 2004 Nov;32(11 Suppl):S595-7. doi: 10.1097/01.ccm.0000147016.53607.c4. PMID: 15542969.

SSC Bundle Studies

The Surviving Sepsis Campaign: Results of an international guideline-based performance improvement program targeting severe sepsis*

Mitchell M. Levy, MD; R. Phillip Dellinger, MD; Sean R. Townsend, MD; Walter T. Linde-Zwirble; John C. Marshall, MD; Julian Bion, MD; Christa Schorr, RN, MSN; Antonio Artigas, MD; Graham Ramsay, MD; Richard Beale, MD; Margaret M. Parker, MD; Herwig Gerlach, MD, PhD; Konrad Reinhart, MD; Eliezer Silva, MD; Maurene Harvey, RN, MPH; Susan Regan, PhD; Derek C. Angus, MD, MPH; on behalf of the Surviving Sepsis Campaign

Crit Care Med 2010 Vol. 38, No. 2

- 15,022 patients, 165 sites
- Adjusted in-hospital mortality decreased 5.4% over the first 2 yrs (95% CI, 2.5–8.4).
- Adjusted odds ratio for mortality improved the longer site was in the campaign, 0.8% per quarter.

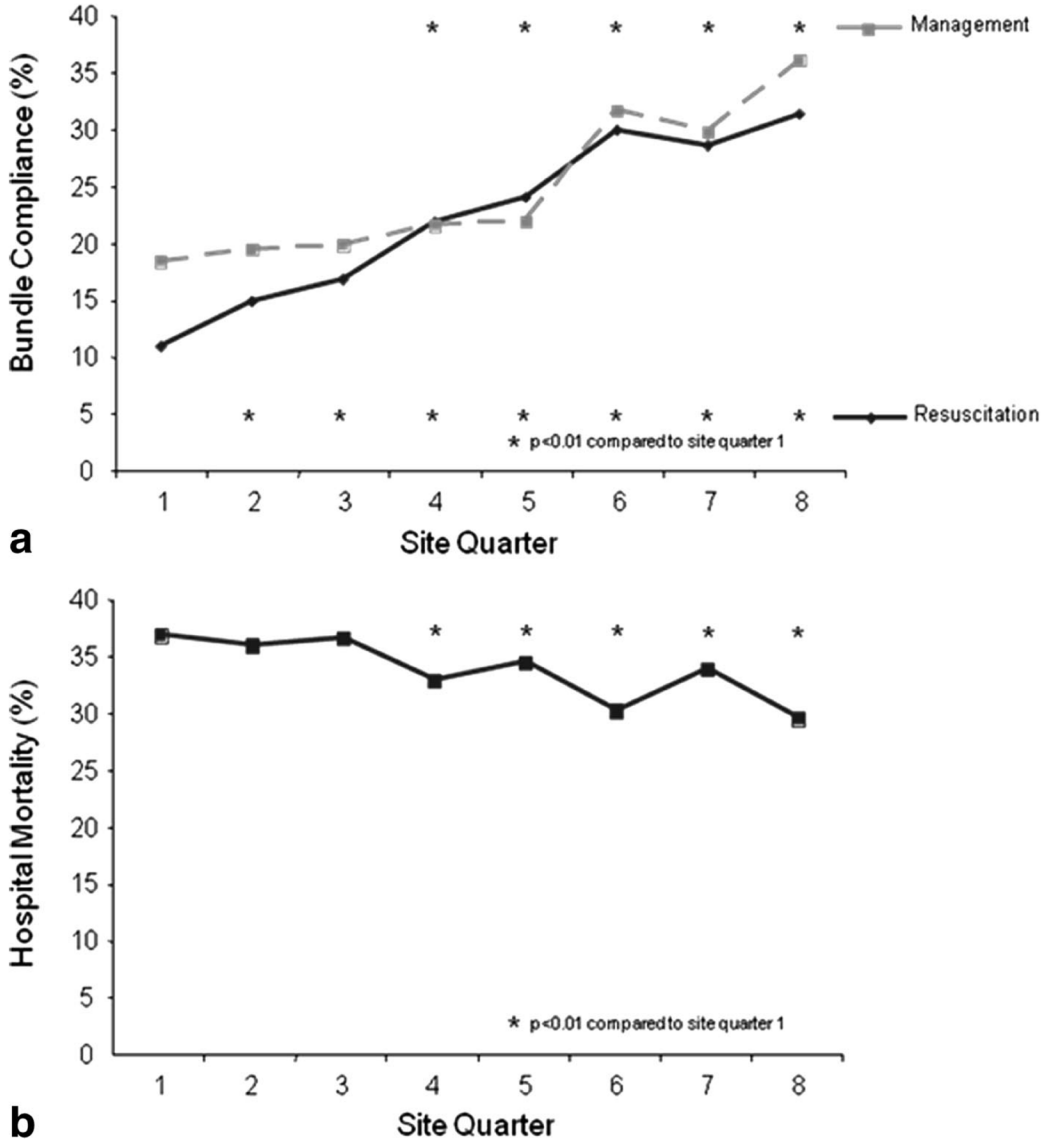


Figure 2. Compliance and mortality change over time. *a*, Change in the percentage of patients compliant with all elements of the resuscitation bundle (*dotted line*) and the management bundle (*solid line*) over 2 yrs of data collection (*$p < .01$ compared with first quarter). Note that both Y axes are truncated at 40% to emphasize relative change over time as opposed to absolute change. *b*, Change in hospital mortality over time (*$p < .01$ compared with first quarter).

Special Article

on Surviving Sepsis Campaign: Associati
nd Outcomes in Between Performance Metrics ar
a 7.5-Year Study

BS, MD (Res)[2]; Gary S. Phillips, MAS[3];
N[5]; Richard Beale, MB BS[6];
D[8]; Jean-Daniel Chiche, MD[9];
llinger, MD, FCCM[11]

Mitchell M. Levy, MD, FCCM[1]; Andrew Rhodes, MB
Sean R. Townsend, MD[4]; Christa A. Schorr, RN, MSN
Tiffany Osborn, MD, MPH[7]; Stanley Lemeshow, PhD
Antonio Artigas MD, PhD[10]; R. Phillip Dellinger

Critical Care Medicine January 2015 • Volume 43 • Number 1

- 29,470 patients, 218 hospitals
- US, South America, Europe.
- Hospital mortality dropped 0.7% per site fore every quarter of participation ($p < 0.001$).

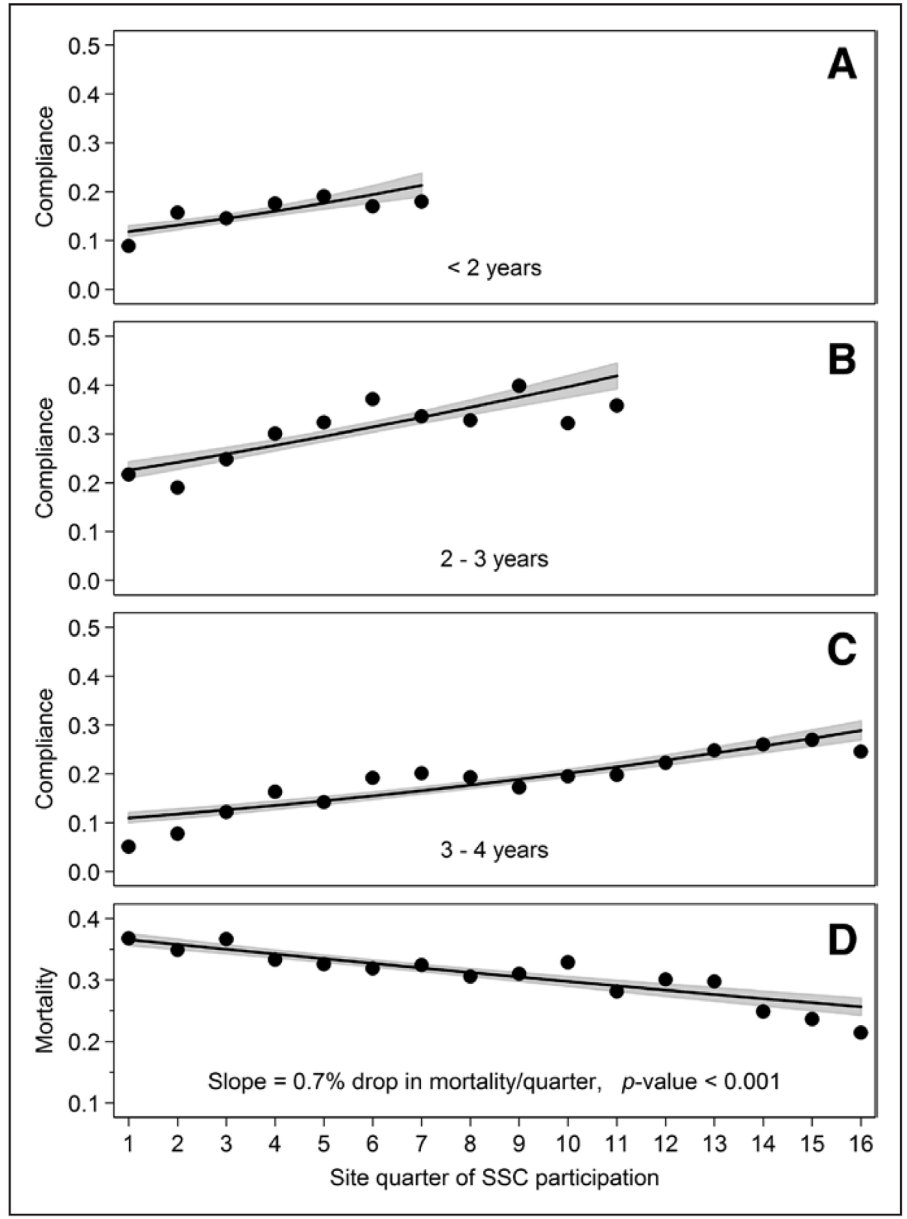


Figure 2. Resuscitation compliance by duration of years of Surviving Sepsis Campaign (SSC) participation (< 2 years, **A**; 2 to < 3 years, **B**; 3–4 years, **C**) and hospital mortality (panel **D**). All panels are based on an unadjusted generalized estimating equation population-averaged logistic regression model where circles represent observed values, lines are based on the regression, and shaded areas are the 95% CIs.

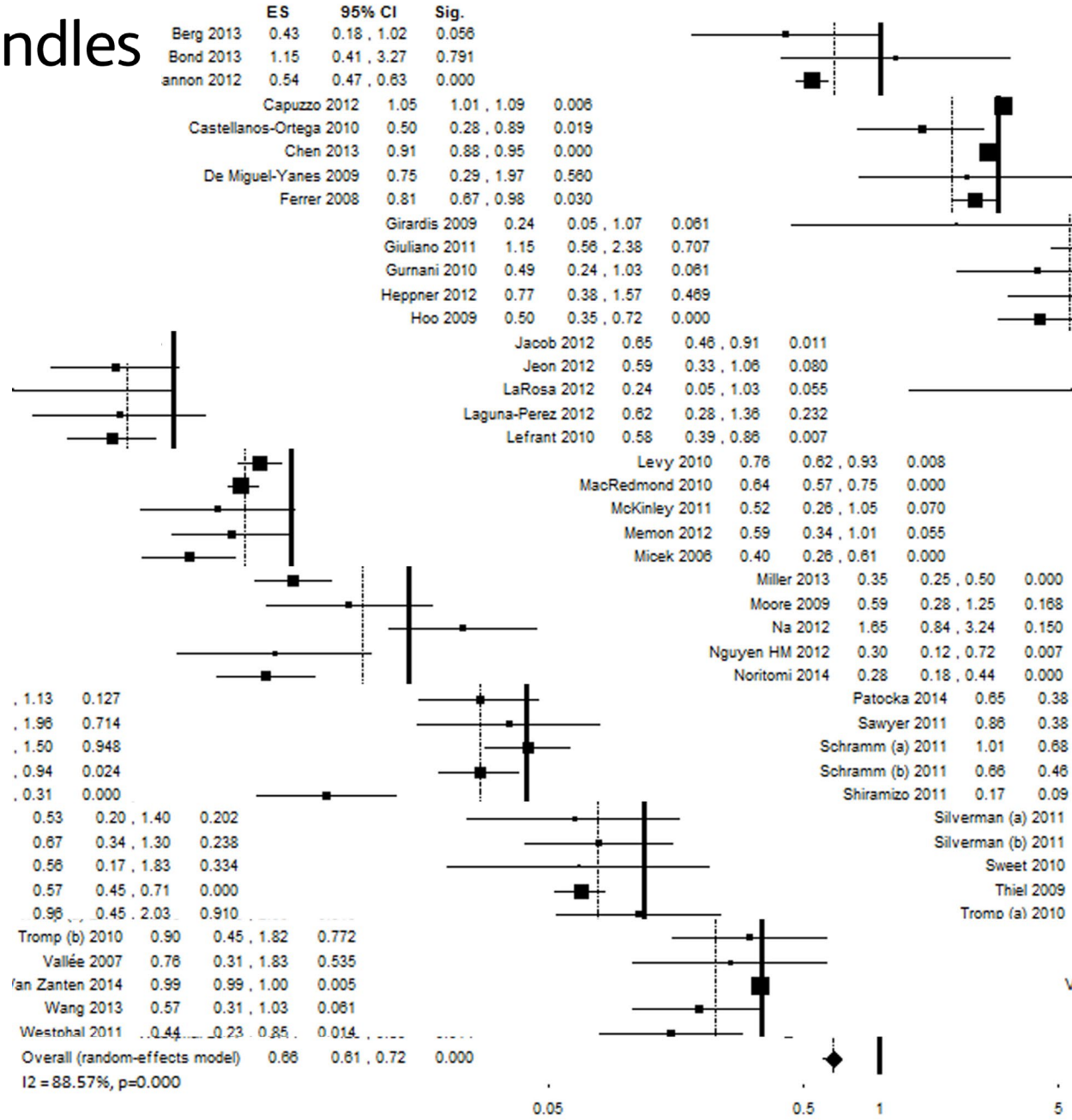
Meta-analyses

Effect of Performance Improvement Programs on Compliance with Sepsis Bundles and Mortality: A Systematic Review and Meta-Analysis of Observational Studies

Elisa Damiani[1]*, Abele Donati[1], Giulia Serafini[2], Laura Rinaldi[2], Erica Adrario[1], Paolo Pelaia[1], Stefano Busani[2], Massimo Girardis[2]

PLOS ONE | DOI:10.1371/journal.pone.0125827 May 6, 2015

- 50 observational studies
- Heterogeneity high for compliance and mortality
- OR for increased compliance 6-hour bundle 4.12 (95% CI 2.95 to 5.76)
- OR for decreased mortality 0.66 (95% CI 0.61 to 0.72)

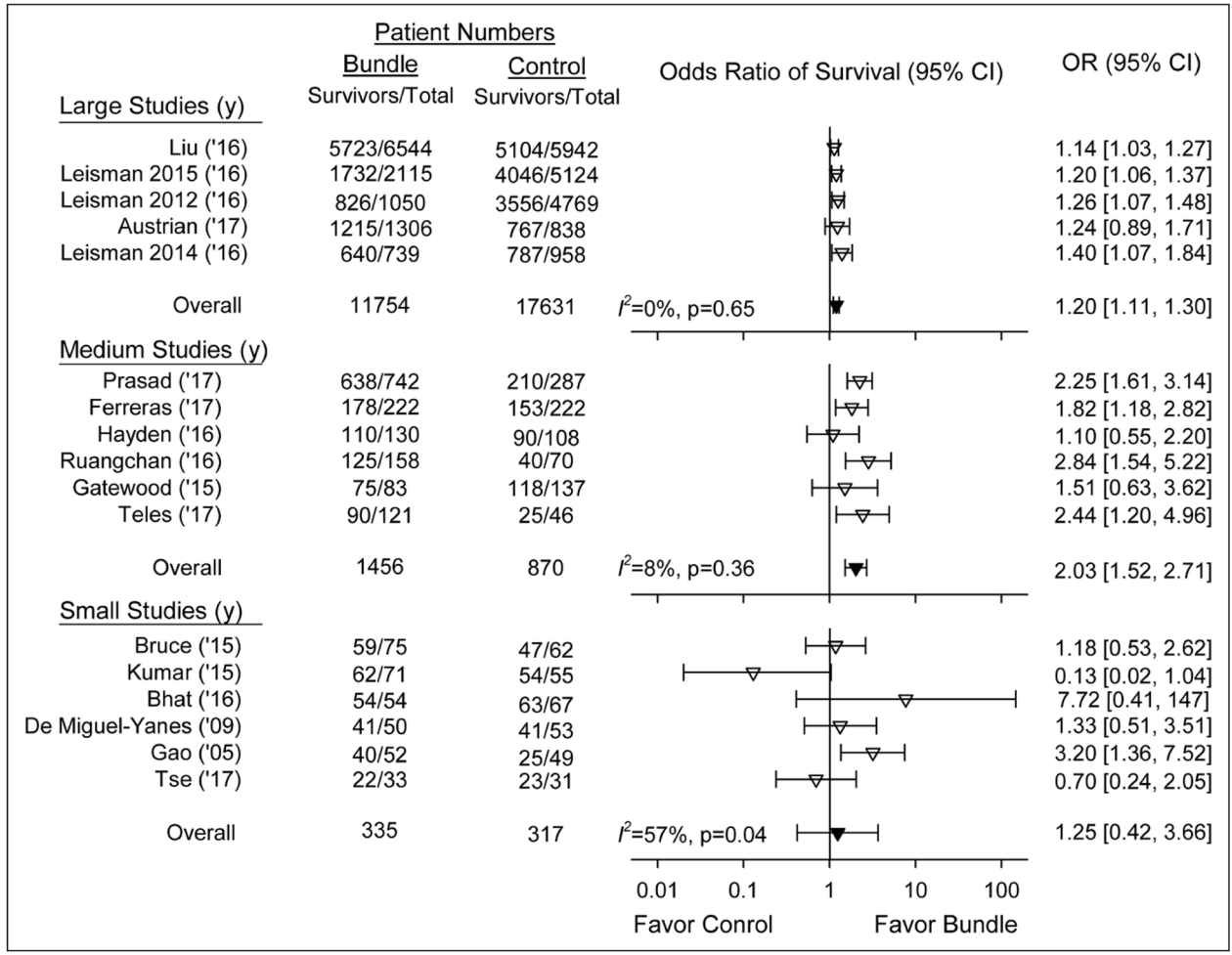


Antibiotic- and Fluid-Focused Bundles Potentially Improve Sepsis Management, but High-Quality Evidence Is Lacking for the Specificity Required in the Centers for Medicare and Medicaid Service's Sepsis Bundle (SEP-1)*

Dominique J. Pepper, MD, MBChB, MHSc[1]; Junfeng Sun, PhD[1]; Xizhong Cui, P
Judith Welsh, BSN, MLS[2]; Charles Natanson, MD[1]; Peter Q. Eichacker, MD[1]

Critical Care Medicine October 2019 • Volume 47 • Number 10

- Bundles were associated with increased odds ratios of survival (odds ratio [95% CI]) in 15 studies with substantial heterogeneity ($I2$ = 61%; p < 0.01). Survival benefits were consistent in the five largest (1.20 [1.11–1.30]; $I2$ = 0%) and six medium sized studies (2.03 [1.52–2.71]; $I2$ = 8%).
- No study had a low risk of bias or assessed potential adverse bundle effects



Contemporary Analyses

ORIGINAL ARTICLE

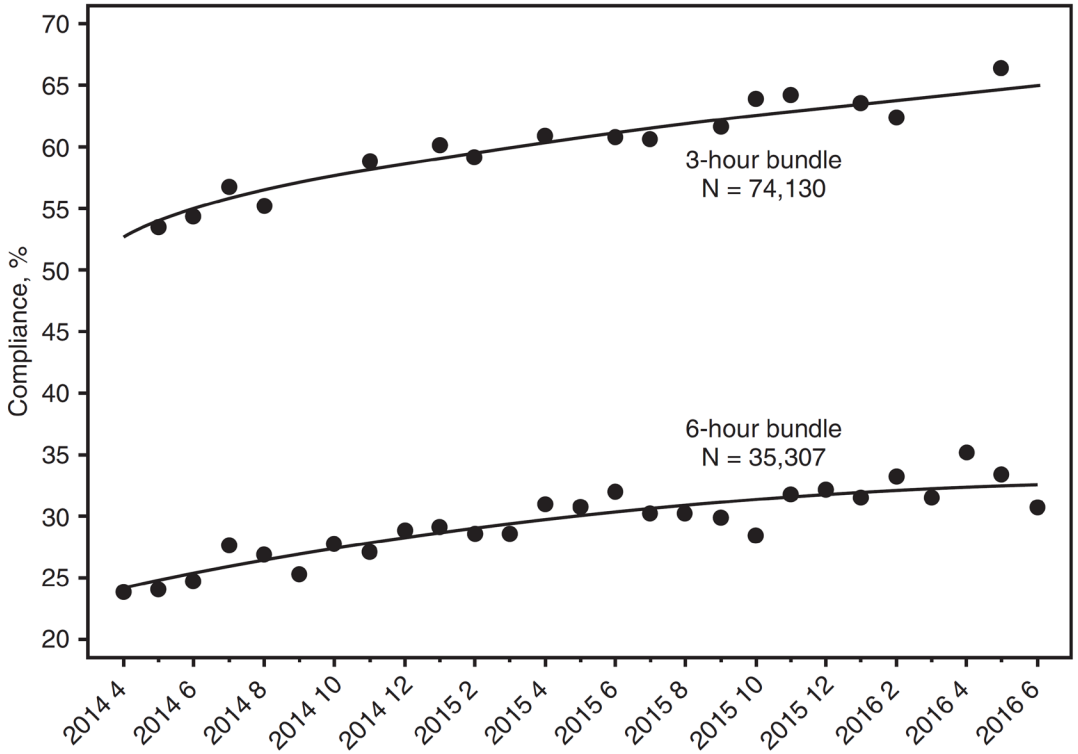
Mortality Changes Associated with Mandated Public Reporting for Sepsis

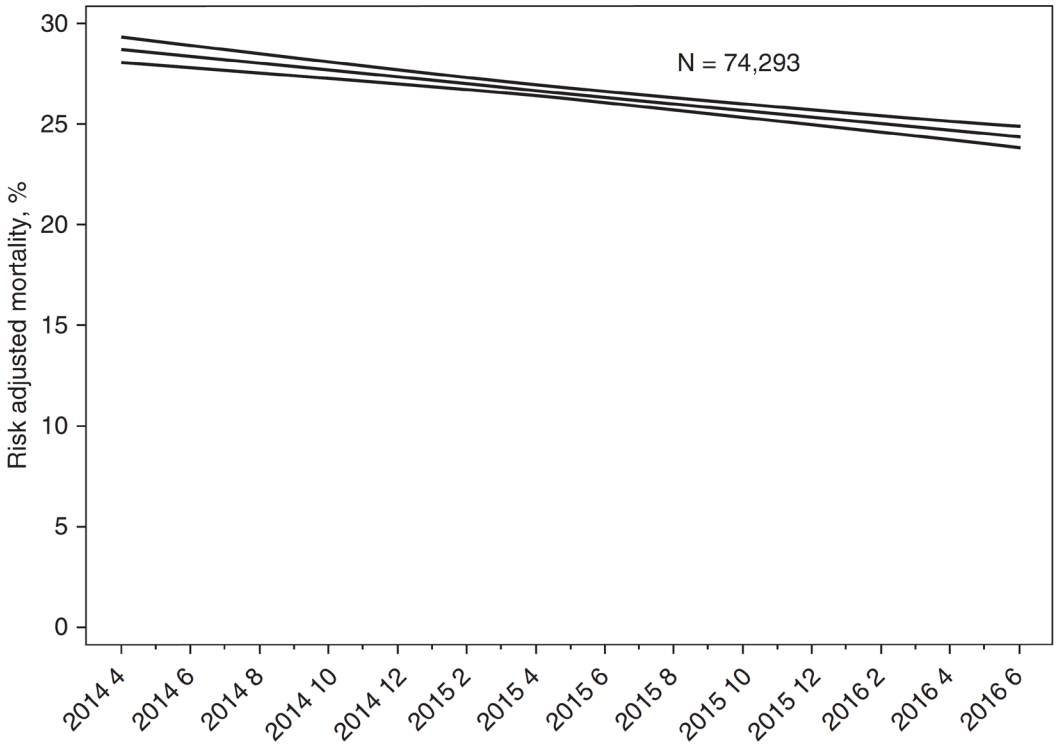
The Results of the New York State Initiative

Mitchell M. Levy[1], Foster C. Gesten[2*], Gary S. Phillips[3*], Kathleen M. Terry[4], Christopher W. Seymour[5], Hallie C. Prescott[6,7], Marcus Friedrich[8], Theodore J. Iwashyna[6,7], Tiffany Osborn[9,10], and Stanley Lemeshow[11]

American Journal of Respiratory and Critical Care Medicine Volume 198 Number 11 | December 1 2018

- Risk adjusted mortality decreased from 28.8% to 24.4% (4.4%, $p < 0.001$)
- 0.17% per month (95% CI 0.167 to 0.169)



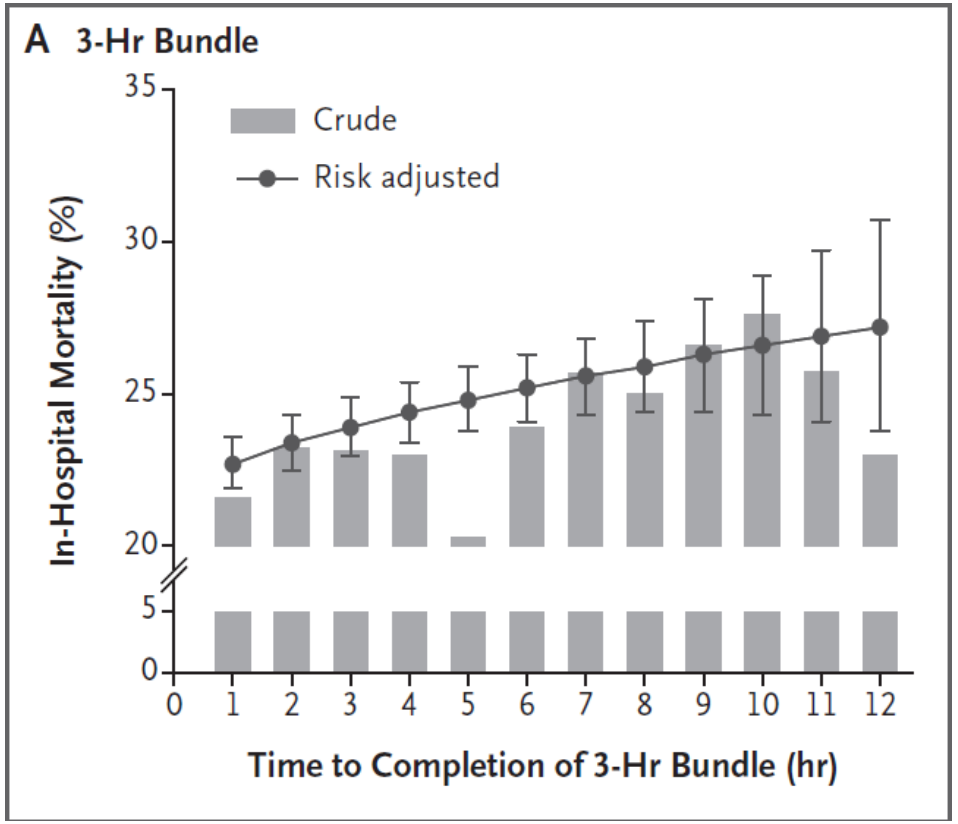


ORIGINAL ARTICLE

Time to Treatment and Mortality during Mandated Emergency Care for Sepsis

Christopher W. Seymour, M.D., Foster Gesten, M.D., Hallie C. Prescott, M.D., Marcus E. Friedrich, M.D., Theodore J. Iwashyna, M.D., Ph.D., Gary S. Phillips, M.A.S., Stanley Lemeshow, Ph.D., Tiffany Osborn, M.D., M.P.H., Kathleen M. Terry, Ph.D., and Mitchell M. Levy, M.D.

- 49,331 patients with sepsis presenting to EDs in New York State
- Examined time to antibiotics and fluids and 3-hour sepsis bundle adherence



Seymour et al. N Engl J Med 2017;376:2235-44

JAMA | Original Investigation

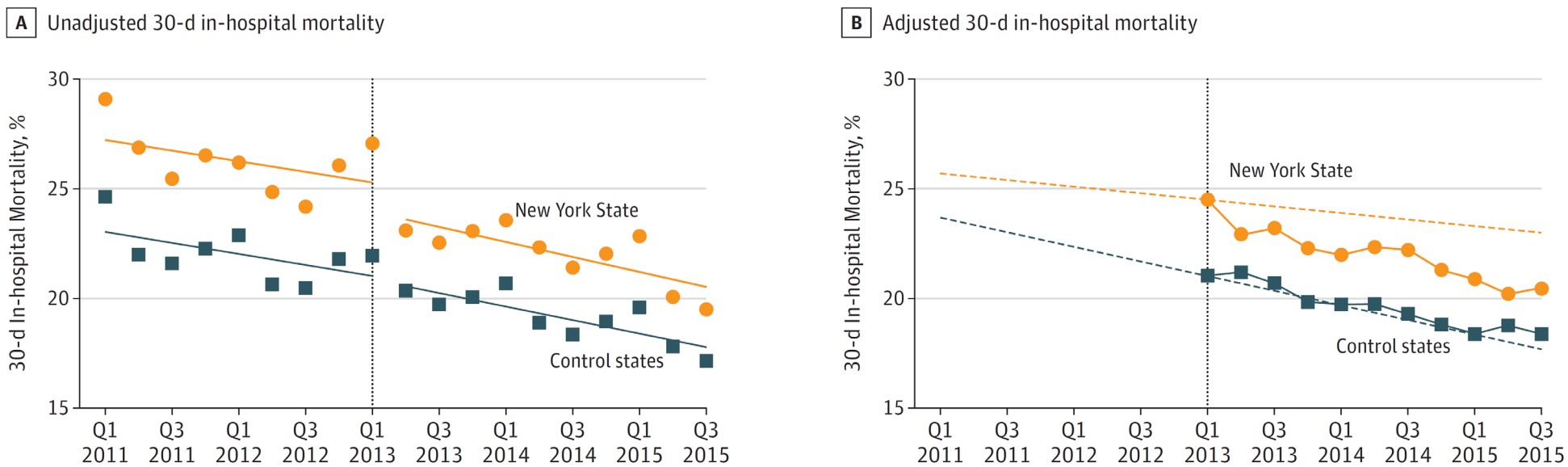
Association Between State-Mandated Protocolized Sepsis Care and In-hospital Mortality Among Adults With Sepsis

Jeremy M. Kahn, MD, MS; Billie S. Davis, PhD; Jonathan G. Yabes, PhD; Chung-Chou H. Chang, PhD; David H. Chong, MD; Tina Batra Hershey, JD, MPH; Grant R. Martsolf, PhD, MPH, RN; Derek C. Angus, MD, MPH

JAMA July 16, 2019 Volume 322, Number 3

- In New York State, mandated protocolized sepsis care was associated with a greater decrease in sepsis mortality compared with sepsis mortality in control states that did not implement sepsis regulations.

Figure 1. Quarter-Specific Estimates of the Primary Outcome



CHEST

Effects of Compliance With the Early Management Bundle (SEP-1) on Mortality Changes Among Medicare Beneficiaries With Sepsis

A Propensity Score Matched Cohort Study

Sean R. Townsend, MD, FCCP; Gary S. Phillips, MAS; Reena Duseja, MD; Lemeneh Tefera, MD; Derek Cruikshank, PSM; Robert Dickerson, RRT, MSHSA; H. Bryant Nguyen, MD; Christa A. Schorr, DNP, RN; Mitchell M. Levy, MD, FCCP; R. Phillip Dellinger, MD, FCCP; William A. Conway, MD; Warren S. Brown and Emanuel P. Rivers, MD, MPH, FCCP

DOI: https://doi.org/10.1016/j.chest.2021.07.2167

Compliance with SEP-1 Decreases Mortality

ARR = 5.67%

(95% CI, 5.33-6.0; P < .001)

RR = 0.794

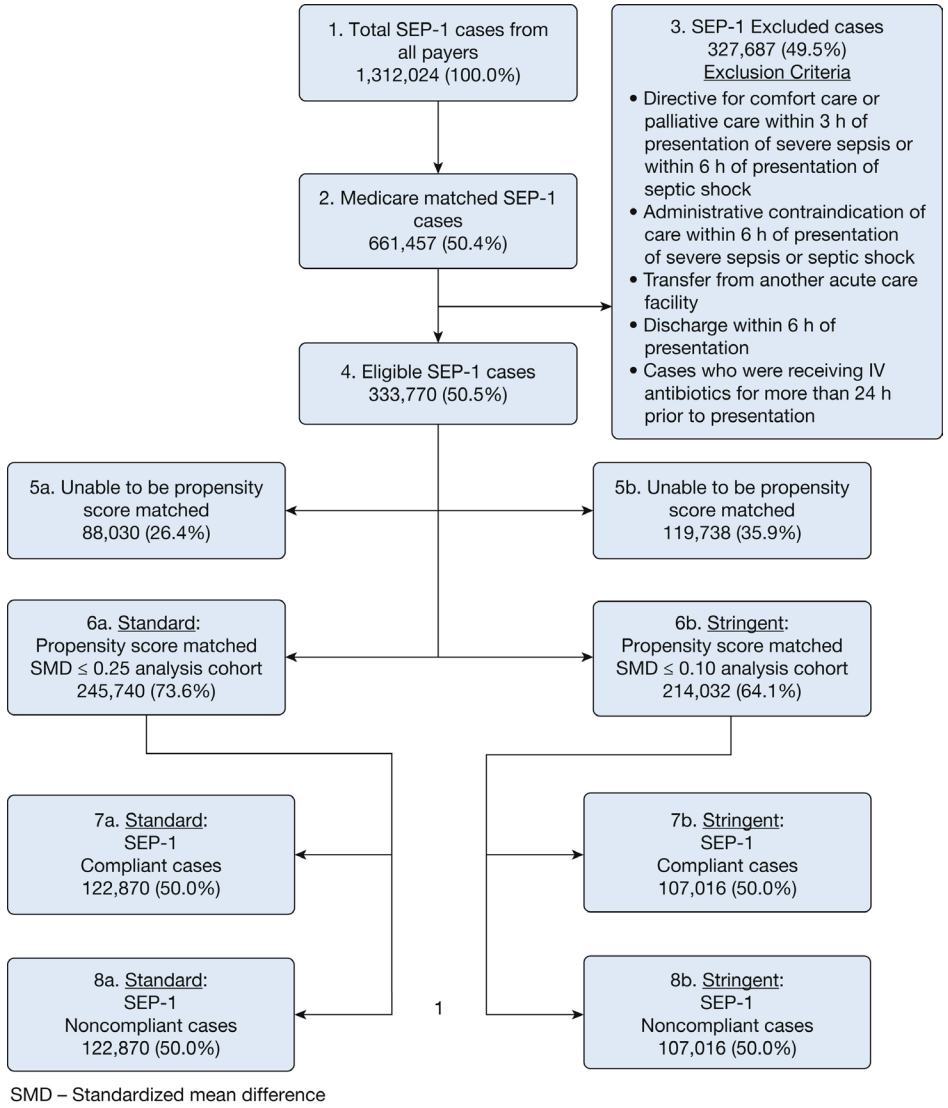
(95% CI, 0.783-0.805)

NNT = 17.65

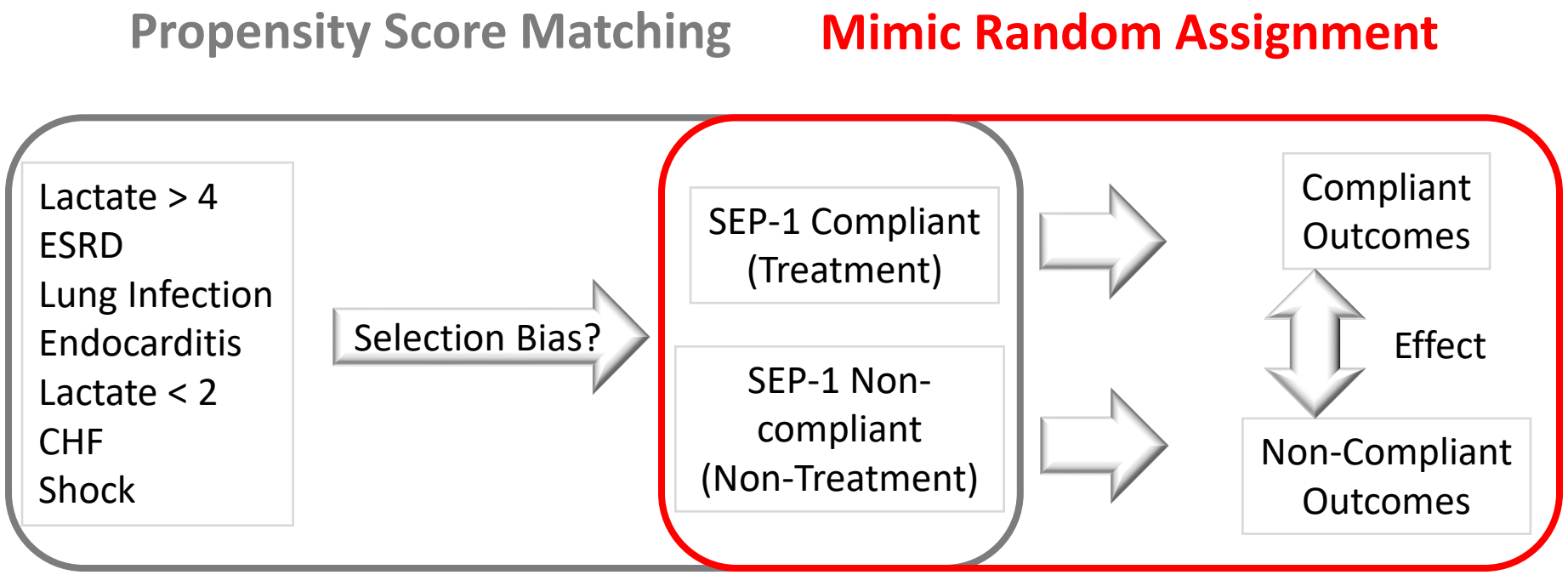
(95% CI, 16.66-18.76)

Consort Diagram

- 1,312,024
- 333,770 patients
- 3,241 hospitals



Propensity Score Matching | Estimating Causal Effect



What did we match on?

14 Hospital Characteristics

- Bed count
- Type of Accreditation
- Critical Access, Urban
- Discharge quarter

9 Patient Characteristics

- Ethnicity
- Race
- Age

76

53 Clinical Characteristics

- Site of infection
- Acute organ dysfunction
- Comorbidities
- Lactate level
- Persistent hypotension
- Shock diagnosis

Matching example:

Patient	Prop score	Status
A	0.12345	comp
B	0.53631	non
C	0.53632	comp
D	0.12346	non
E	0.99998	non
F	0.99997	non
G	1.0	comp

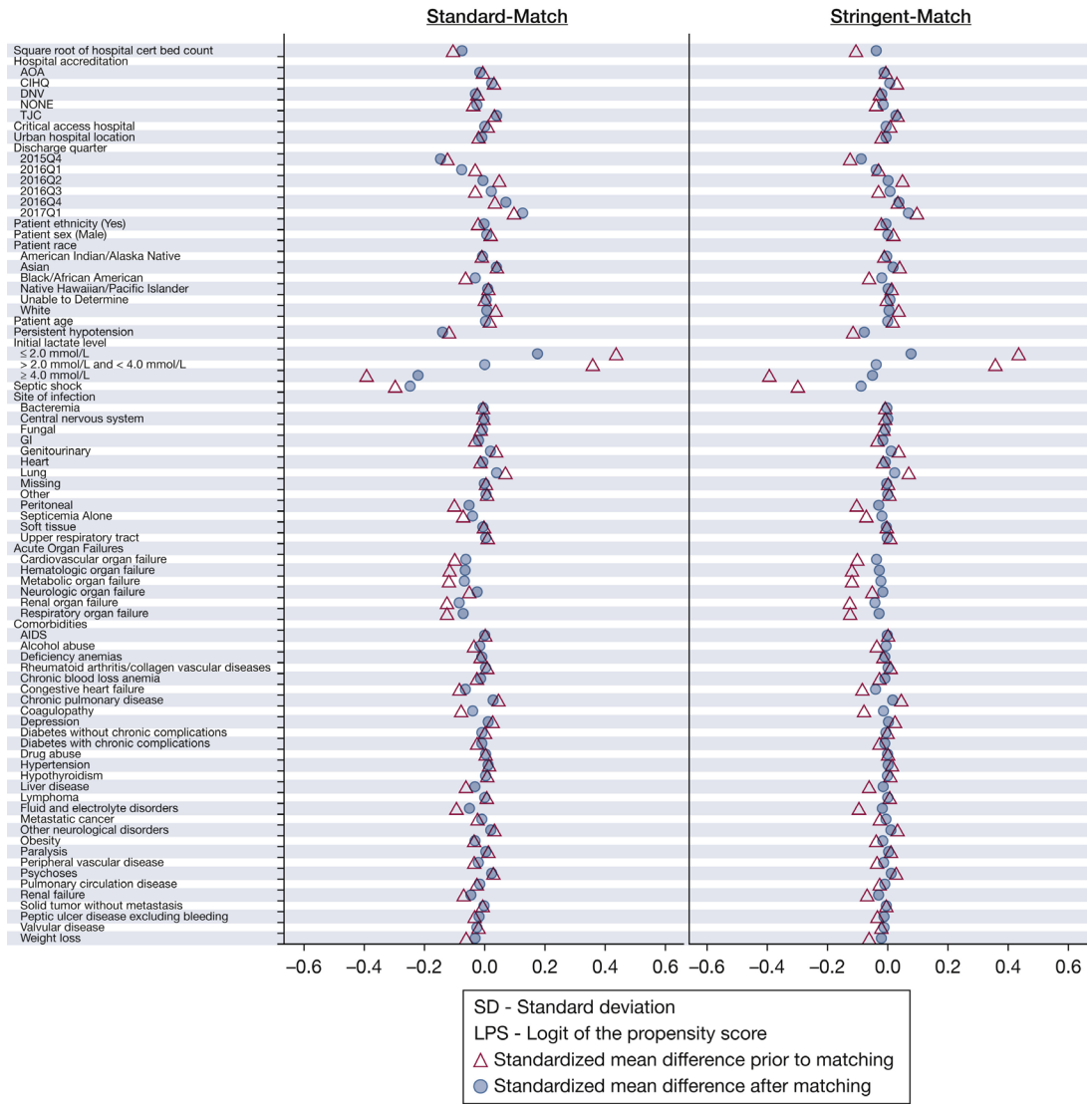
Compliant	Non-compliant
• A	D
• C	B
• G	E

Outcome ⟷ **Outcome**

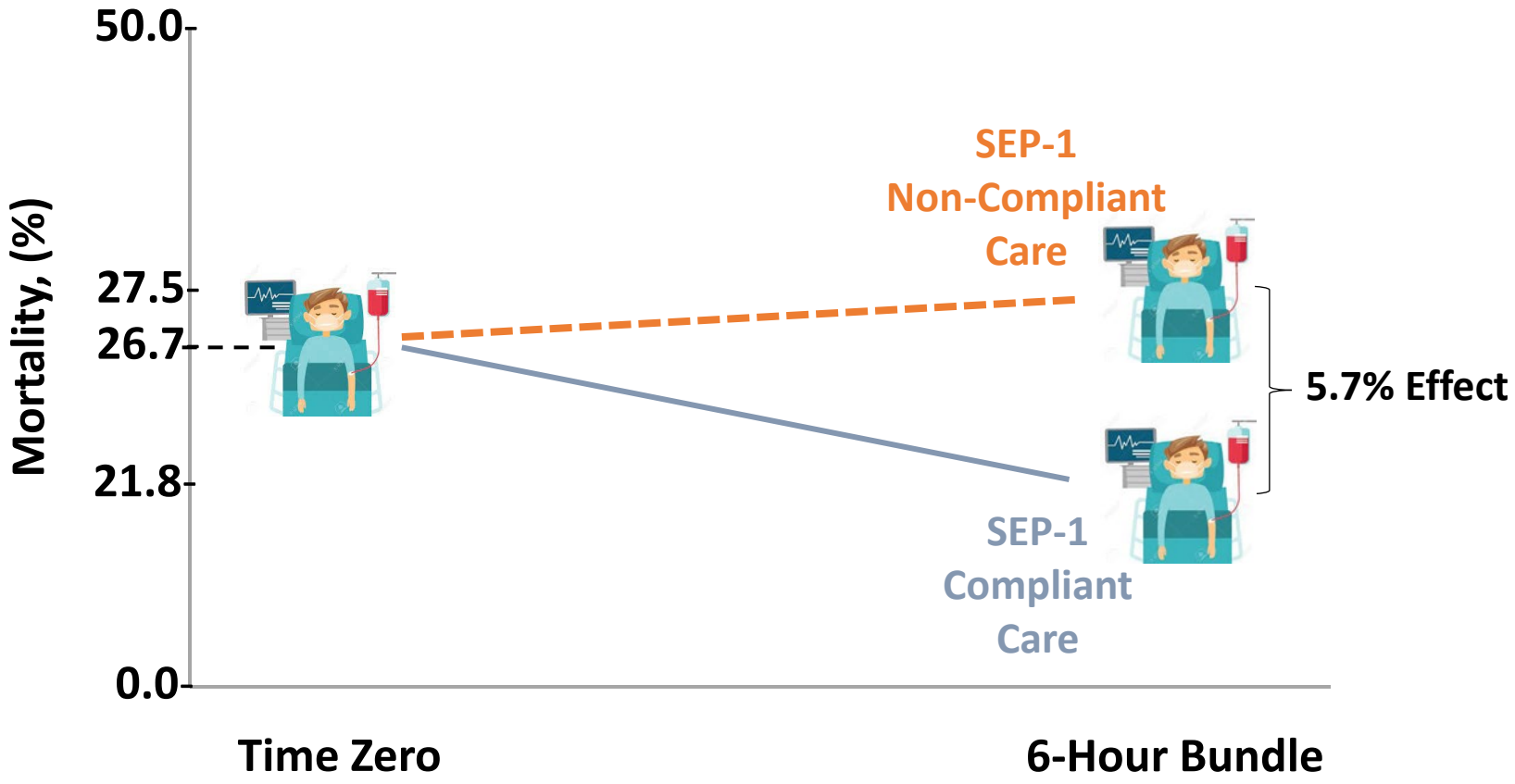
Matching output

Standardized mean difference

- = measure of distance between two means ÷ within group standard deviation.
- Closer to 0.0 means less difference between the group means
- 2 standards in literature
  - < 0.25 = “standard match”
  - < 0.10 = “stringent match”



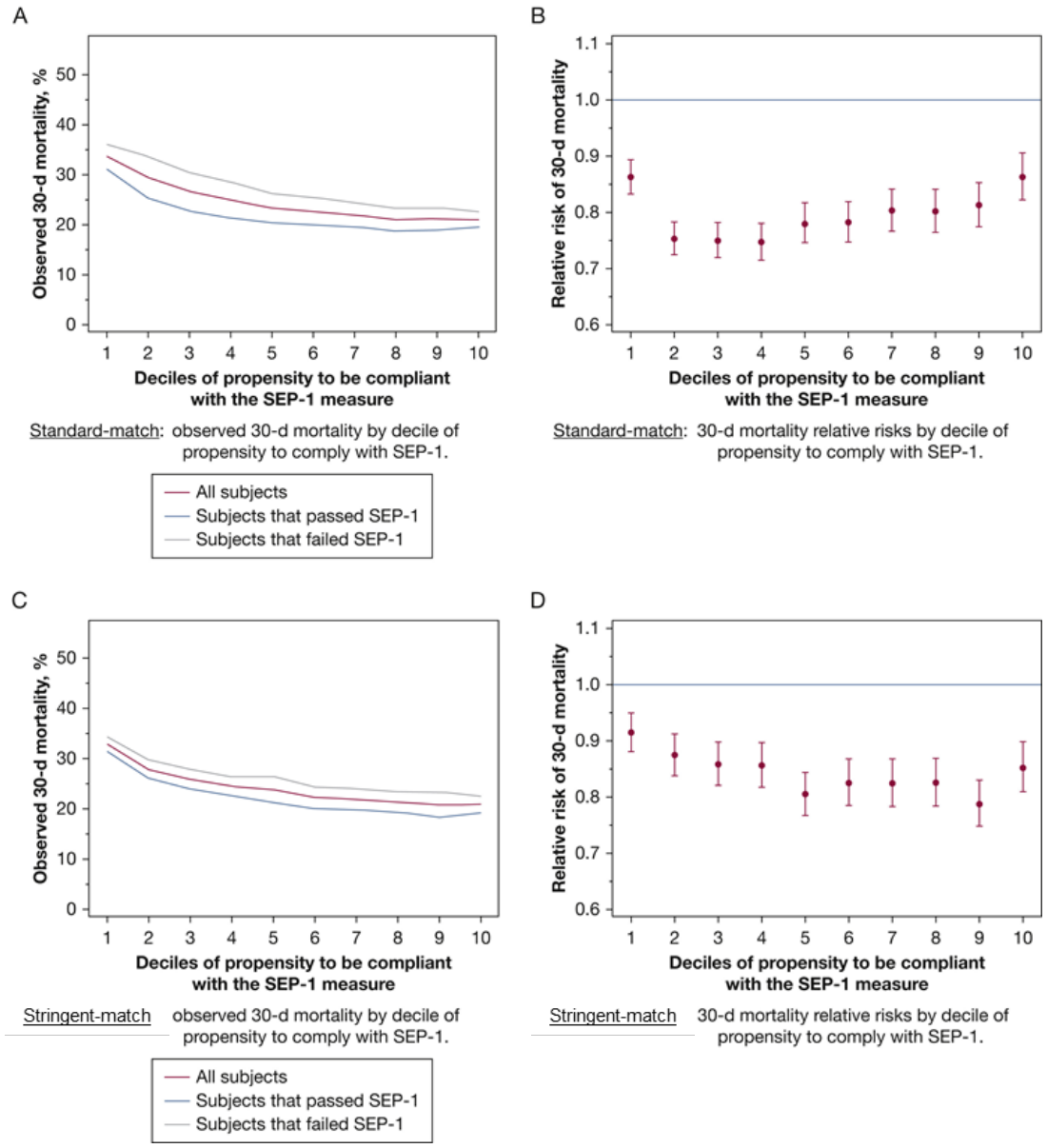
Standard-match: Effect of a sepsis bundle



Propensity score matching compares groups with equal likelihood of compliance (patient characteristics, hospital factors).

Outcomes: Deciles of Compliance

- Propensity score = probability of compliance from 0 to 1
- Can divide that probability into deciles
- At every probability of compliance, passing trumps failing.



Element level treatment effects

- All elements correlated with reduction in mortality except vasopressors
- Vasopressor use known marker for SOI
- Reassessment not significant

TABLE 3] Element-Level Unadjusted and Adjusted Conditional Treatment Effects Based on the Hierarchical Generalized Linear Model Logistic Regression Model

Bundle: Treatment Section and Elements	No. of Eligible Cases	Pass Rate (%)	Compliant 30-d Mortality (%)	Noncompliant 30-d Mortality (%)	Conditional Adjusted OR	Conditional Adjusted OR 95% CI	*P* Value
Complete SEP-1 bundle[a]	333,770	42.1	21.7	30.3	0.829	0.812-0.864	< .001
Severe sepsis 3 h: initial lactate level	159,646	86.0	26.2	32.0	0.772	0.743-0.802	< .001
Severe sepsis 3 h: antibiotic administration	137,252	88.5	25.8	29.0	0.844	0.798-0.892	< .001
Severe sepsis 3 h: blood culture	121,454	90.0	25.3	30.8	0.867	0.827-0.908	< .001
Severe sepsis 3-h bundle	159,646	68.5	25.3	30.8	0.803	0.779-0.828	< .001
Severe sepsis 6-h bundle: repeat lactate level	74,349	62.6	27.0	26.9	0.885	0.851-0.921	< .001
Shock 3-h bundle: crystalloid fluid administration	24,357	62.2	34.1	34.8	0.915	0.855-0.980	.011
Shock 6 h: vasopressors	5,332	77.3	39.3	29.1	1.317	1.126-1.541	< .001
Shock 6 h: reassessment	9,931	38.1	38.0	36.5	1.012	0.920-1.114	.807
Shock 6 h: vasopressors and reassessment	4,122	42.5	40.8	38.3	1.014	0.879-1.169	.846
Shock 6-h bundle	11,141	34.0	38.0	35.3	1.048	0.955-1.149	.326

[a]Data inclusive from quarter 4, 2015, to quarter 1, 2017; data in all other rows represent quarter 4, 2015, to quarter 2, 2016.

Compliance Matters…

Thank you