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Complexity, Reliability and Their Roles in Healthcare Delivery Today

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President and CEO

Banner Health

Discussion Agenda



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- Challenges and Opportunities For Healthcare Redesign
- Evolution of Health Care Delivery in Modern Era
- Evolution of Financing Health Care in US
- Banner's Organizational Design in Response
- Some Clinical Improvement Results

A Summary: Challenges and Opportunities



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- **Challenges**

- Financial – “The belief in waste”
- Consumer – “Help me navigate” and “It’s my money now”
- New Complexities – “Knowing what to do is no longer enough”
 - The new role for the science of reliability
- The Anchor of our Past
- The Threat to the Professional
 - “Doctored: The Disillusionment of an American Physician” - Sandeep Jauhar

- **Opportunities**

- The Force of the Market
- Disruptive Competition
- A New Emphasis on Clinical Knowledge and “Managing Health”

Three Phases of Clinical Delivery in the Modern Era*



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1. Understanding and Classifying Disease
2. Defining Treatments
3. Designing Care Delivery

* David Cutler, Harvard Health Economist

I. “Classifying Disease”

1900



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First issue of the “International Classification of Diseases”

- “ICD-1”
- Causes of death (191)



Residential Medical Office, Otego, NY
1900

II. “Defining Treatments”

1950



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Advent of truly effective therapies:

- Vaccines for childhood illnesses including polio
- Significant use of penicillin
- New drugs for glaucoma, arthritis
- First organ transplant



Colorado physician, Life Magazine, 1948

III. “Designing Care Delivery”

2000 →



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A Response to:

-- Q:

-- R

-- S

-- T

III. “Designing Care Delivery” 2000 →



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A Response to:

- Q: Quality (and Reliability), the Boeing Story
- R
- S
- T

“Reliability”

Isn't 99% accuracy pretty good?



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“If we had to live with 99.9% (10^{-3}) , we would have:

- 2 unsafe plane landings per day at O'Hare
- 16,000 pieces of mail lost every hour
- 32,000 bank checks deducted from the wrong account every hour”

W.E. Deming

The “Human” Role



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- What we do well:
 - Judgment
 - Prioritization
 - Empathy
- What we do not so well:
 - Vigilance
 - Overcoming biases/habits/confidence mismatches
 - Simultaneous multiples

Is knowledge sufficient?



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“Fallibility is part of the human condition”

“We can’t change the human condition”

“We can change the conditions under which people work”

James Reason, author of “Human Error”

Strategies used to improve reliability in health care:

- System Design:
 - Automation, Decision support
 - Adoption of evidence/consensus based practices
 - Consistent processes, “teams” of care
 - Address human factors with Bundling, Redundant design

- A Culture that encourages “Making safe choices”

III. “Designing Care Delivery”

2000 →



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A Response to:

- Q: Quality (and Reliability), the Boeing Story
- R: Retail (New Expectations)
- S: Safety (The Hidden Incidents)
- T: Transforming business and service models



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Three “Phases” of Financing Healthcare

1960's – 70's: “Insured Care”



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- Growth of Commercial Insurance
- Medicare 1965
- The notion of “cost plus” and “reimbursement”
- Cost Curve:
 - % GDP in 1960: 5.3%
 - % GDP in 1970: 7.2%



1980's – 90's: “Managed Care”



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- National Insurance Companies
- HMO Legislation 1974
- Blue Cross and Blue Shield Merger 1982
- Product Innovation: HMO, PPO, POS
- Case Rate, Diagnosis Related Group Payments
- Cost Curve:
 - % GDP in 1980: 9.1%
 - % GDP in 1990: 12.2%



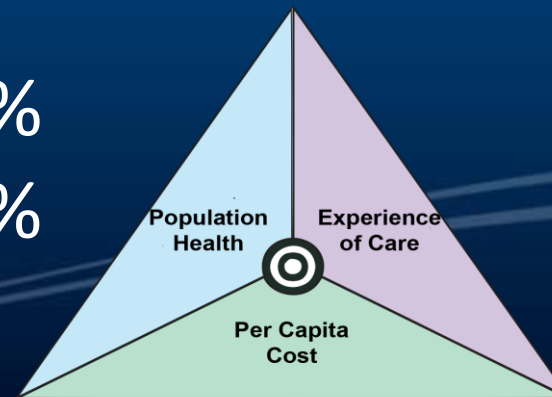
**BlueCross
BlueShield**

2000's - : "Accountable Care"



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- FFS → P4P, Bundling, Provider Risk, Accountable Care Org's
- Outcome based payment penalties
- Growing concerns around clinical issues: patient safety, reliability, geographic variation
- Cost Curve:
 - % GDP in 2000: 13.8%
 - % GDP in 2010: 16.4%



IHI Triple Aim



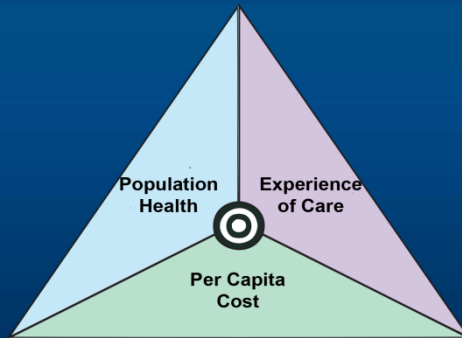
Integrated Accountable Care



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“Sales”



IHI Triple Aim



“Engineering”



“Manufacturing”



Corporate Support Services



Strategic Growth Team



Clinical Product Design Team



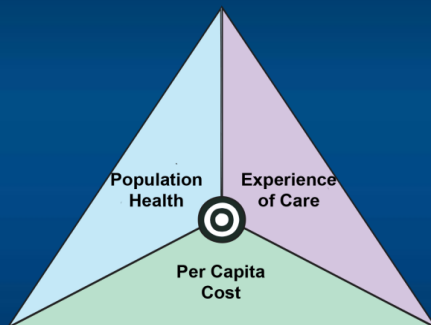
Integrated Delivery Team



“Sales”

“Engineering”

“Manufacturing”



IHI Triple Aim



System Operations Team



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Organizational Structures which:

- Honor the contributions of clinician experts
- Leverage the “Operating Company Model”
- Take advantage of the Board which is “on-board”
- Recruit deep physician talent for leadership
- Train clinicians in leading change
- Encourage the multi-disciplinary approach
- Engage engineering expertise
- Deploy technology to simplify care



“Engineering” New Models Banner Health





Clinical Consensus Groups

CARE MANAGEMENT COUNCIL

ANESTHESIA

Josh Bloomstone
Kelly Kiefer

BEHAVIORAL HEALTH

Gagan Singh
Nancy Sylvester

CRITICAL CARE

Nidhi Nikhanj
Gary Foster

CV SURGERY

Michael Maxwell
Marianne LaFleur

NEURO-SCIENCES

Norm Wang
Al Wildman

ED

David Cohen
Dan Lingle

NICU/Newborn

Greg Martin
Kathleen Walker

PALLIATIVE CARE

M Joseph
Kristine Salmon

PULMONARY

Rajeev Saggar
Chuck Ramirez

LONG TERM CARE

Natalya Faynboym
Kelly Johnson

WOMENS HEALTH

Michael Urig
Ellen Anthony

PEDIATRICS

Bill Schneider
Sandra Marken

INFECTIOUS DISEASE

Edwin Yu
Joan Ivaska

PHARMACY & THERAPEUTICS

Joe Lozon
Nathan Spence

SURGERY

Jon King
Nancy Adamson

NEPHROLOGY

Dharminder Marwah
Debbie Kohm

MEDICAL IMAGING

Threasa Frouge
Erica Dorward

CARDIOLOGY

Paul Hurst
Dana Lauer

HOSPITAL MEDICINE

Cheryl O'Malley
Terri Paulus

PRIMARY CARE

Mary Ellen Dirlam
Heidi Costello

ORTHO

David Jacofsky
Young An

ONCOLOGY

Daniel Chamberlain
Kathy Altergott

Technology/Tele-Health Integration



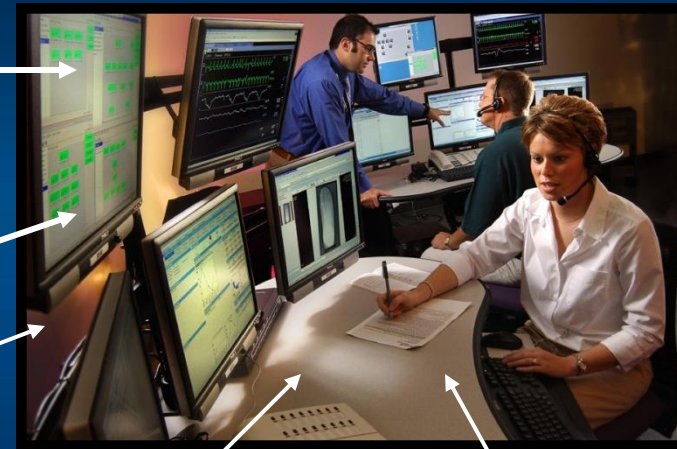
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ICU & Med Surg beds

Remote Operations Center



2-way audio video communication



Care Team

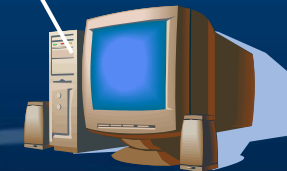


Cerner

Vital Signs



PACs



Decision Support
eCare Manager
Smart Alerts

Implementation Science ^{*}



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4 Groups of Variables which Influence Adoption

1. The External Environment (i.e. Payment changes)
2. Organizational Structure (i.e. an IDS)
3. The Character of the Change (i.e. Power of the Evidence)
4. The Processes Used (i.e. Design, Decision Making, Leader accountabilities, etc.)

Fisher ES, Shortell SM, Savitz LA. Implementation Science – A Potential Catalyst for Delivery System Reform. JAMA. 2016;315(4): 339-340.



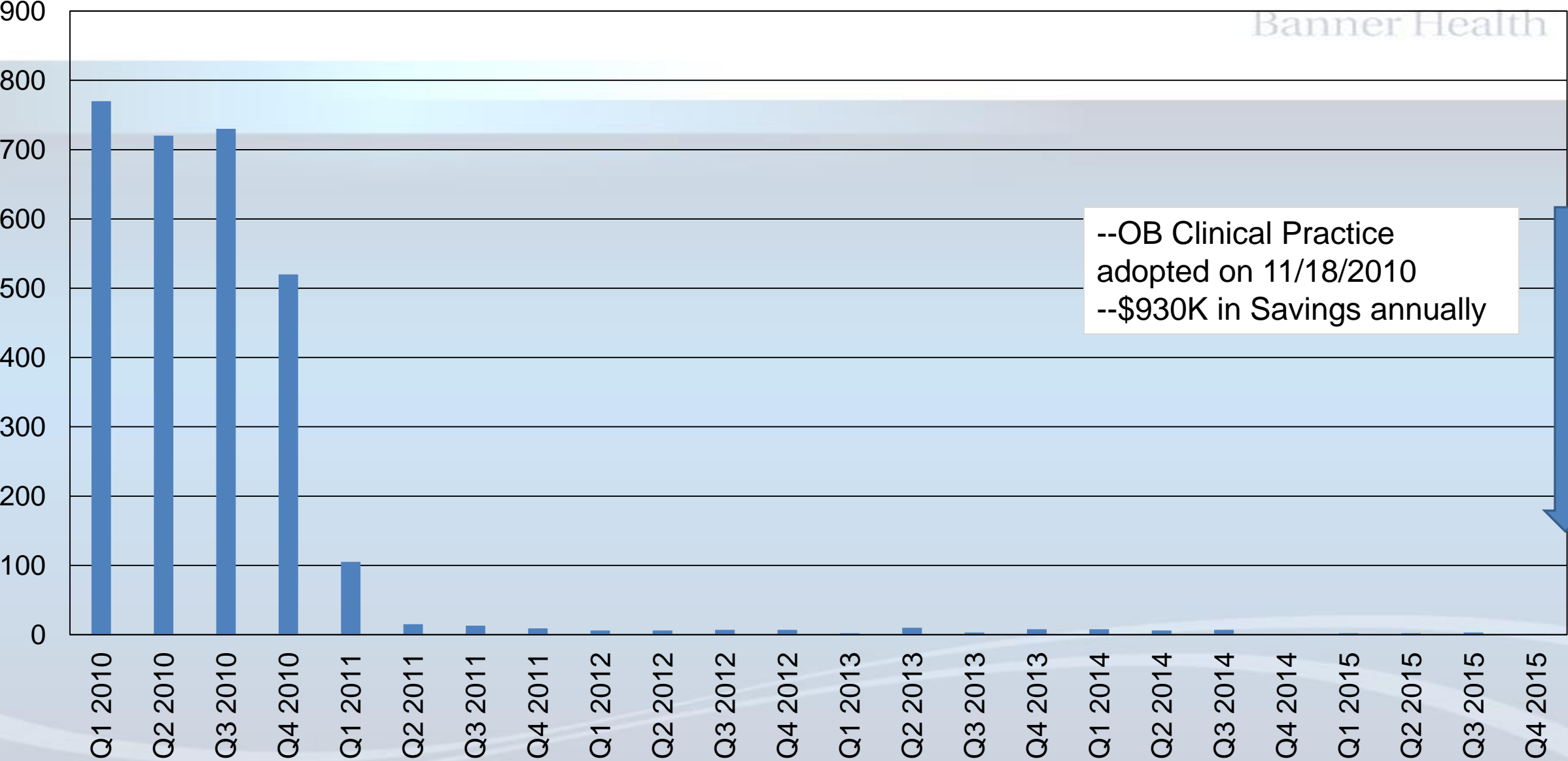
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Some Improvement Results

Adhesion Barrier in OB



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--OB Clinical Practice adopted on 11/18/2010
--\$930K in Savings annually



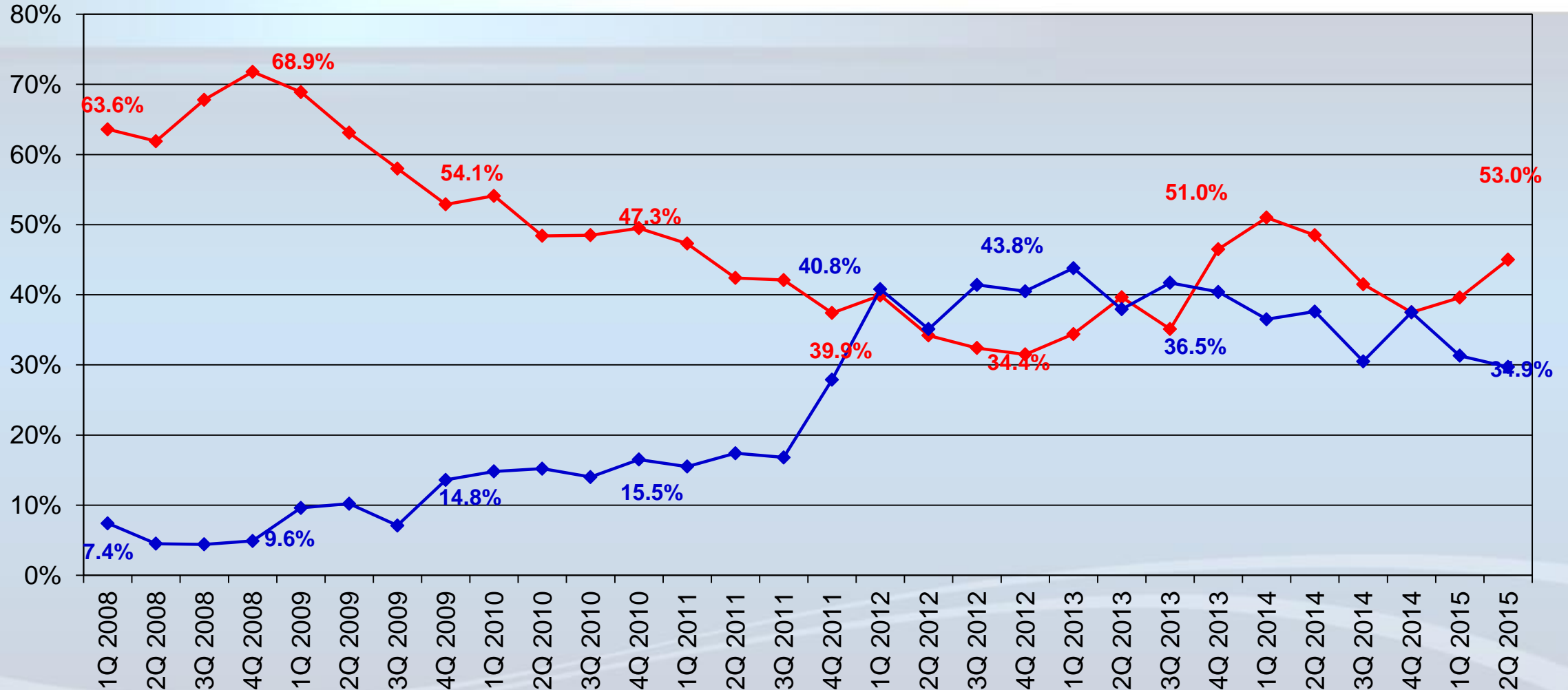
2008 - 2015 CT Scan vs Ultrasound Use



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% of Peds Appendicitis Patients Who Received an Abdominal/Pelvic CT Scan or Ultrasound

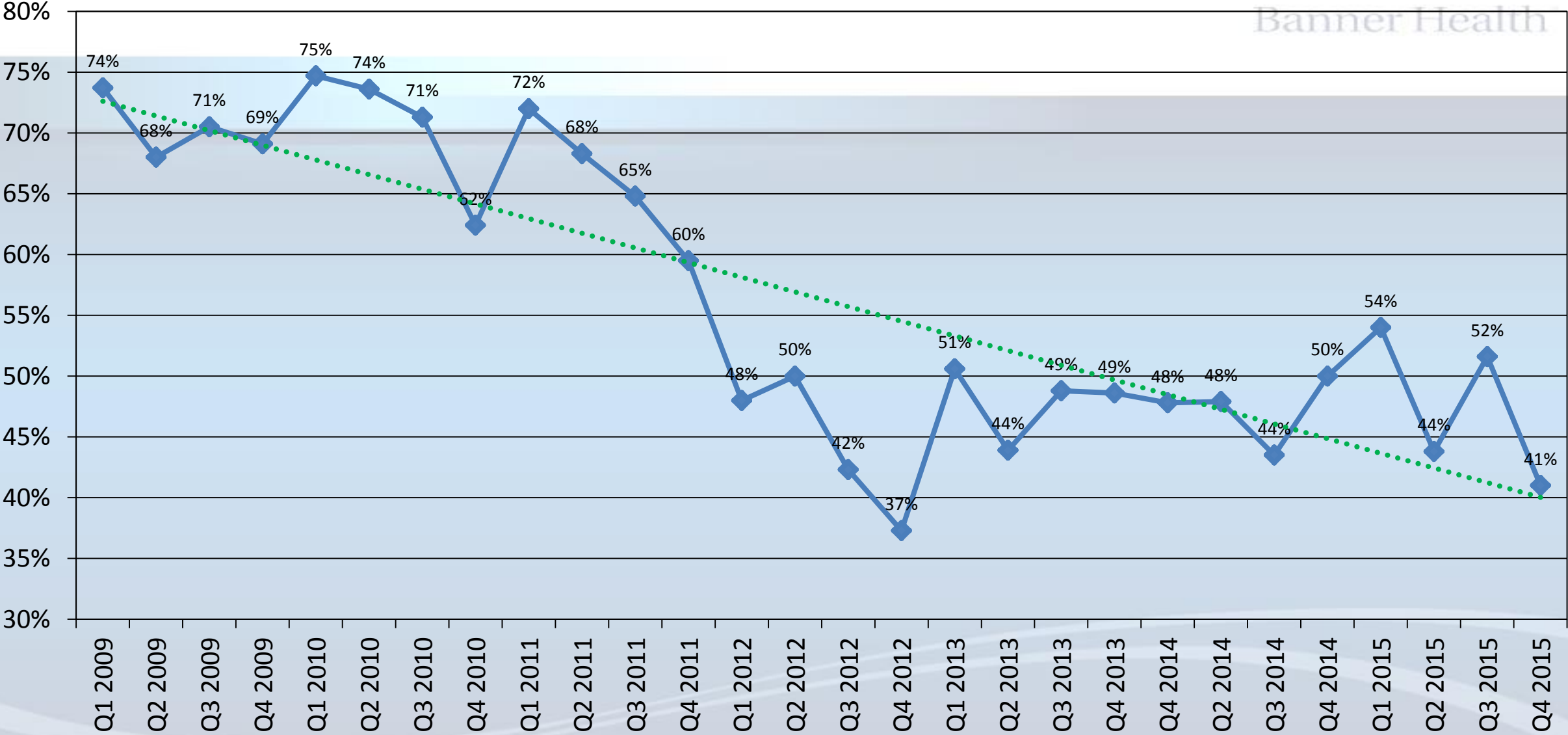
◆ % CT Scans ◆ % Ultrasounds



Peds Asthma Inpatient Chest X-Ray



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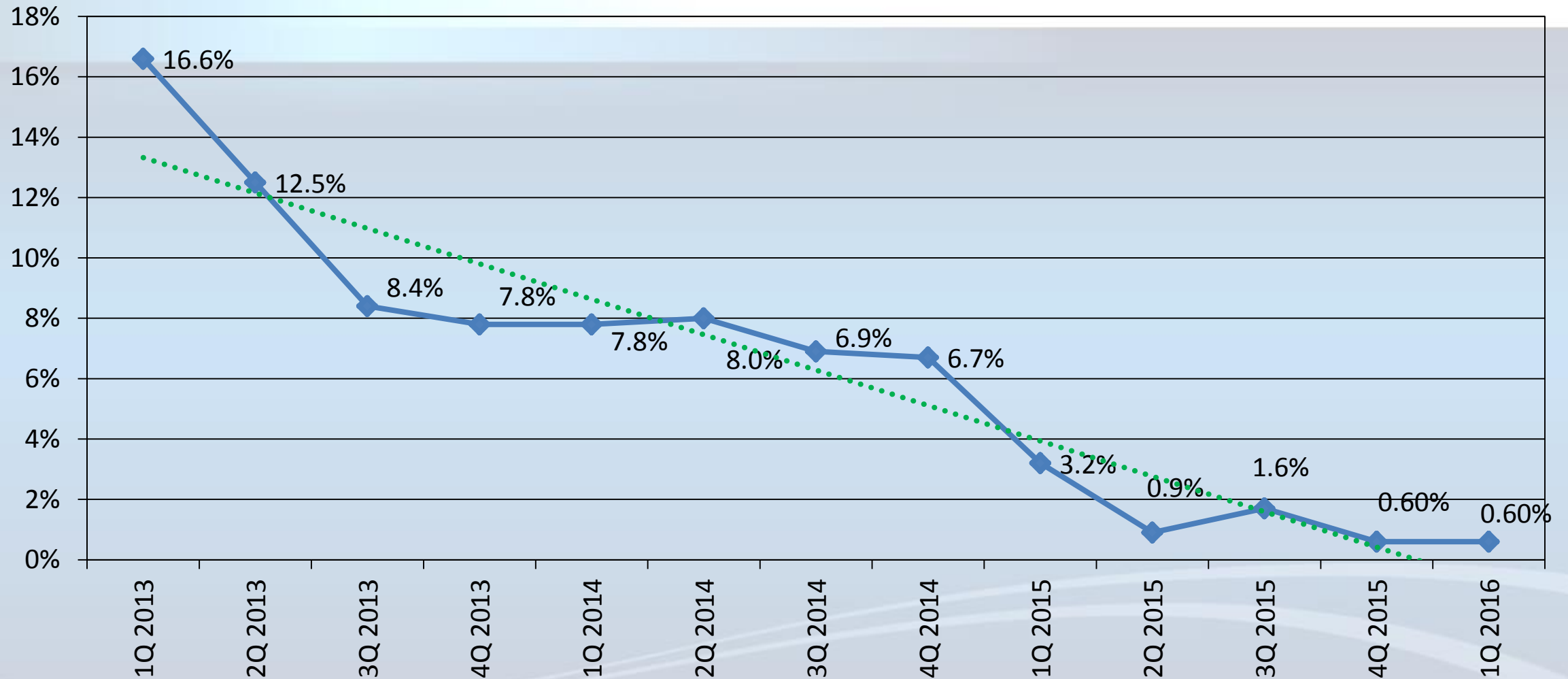


Reduce Variation in Blood Utilization

Orthopedic: Hip/Knee



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Central Line Associated Blood Stream Infections (CLABSI)

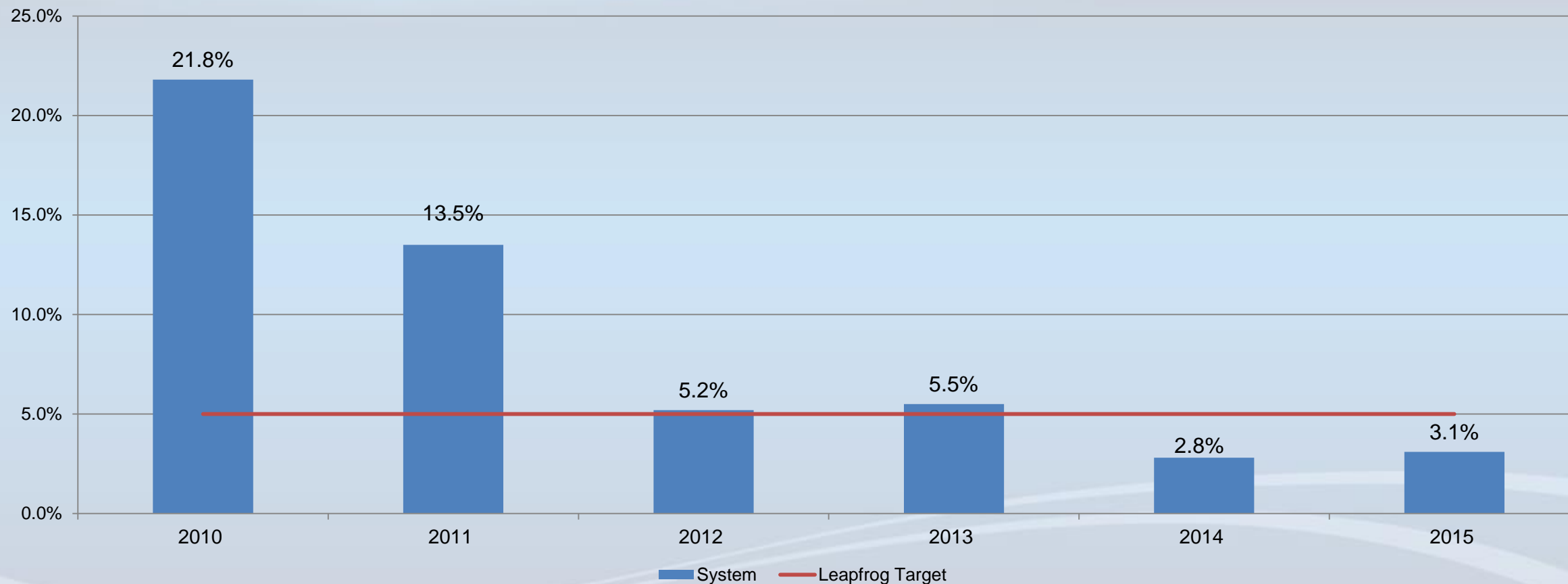
ICU Central Line Infections per 1,000





Early Elective Deliveries

Banner Health System Leapfrog Data: Elective Deliveries < 39 weeks

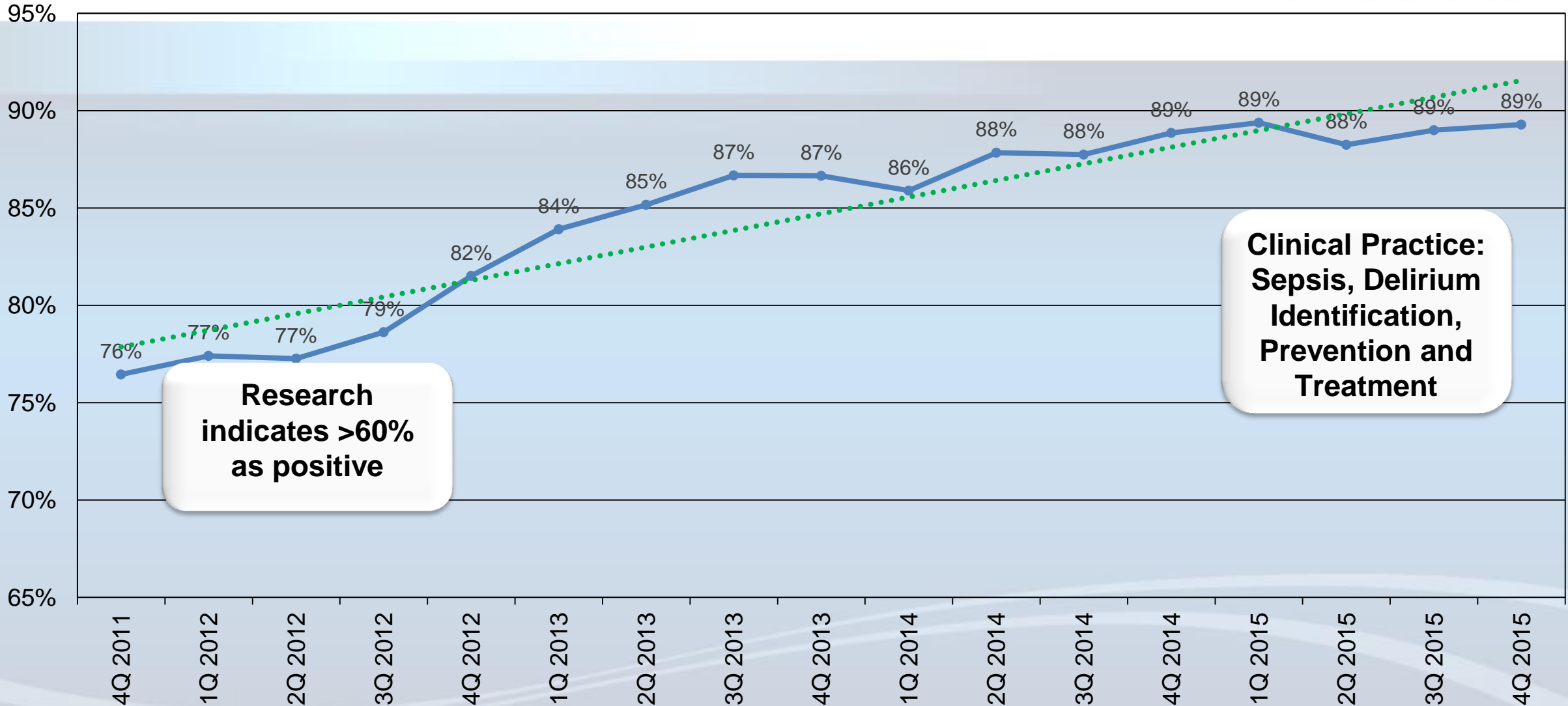


Delirium and Coma Free Days

Intensive Care Patients



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Research indicates >60% as positive

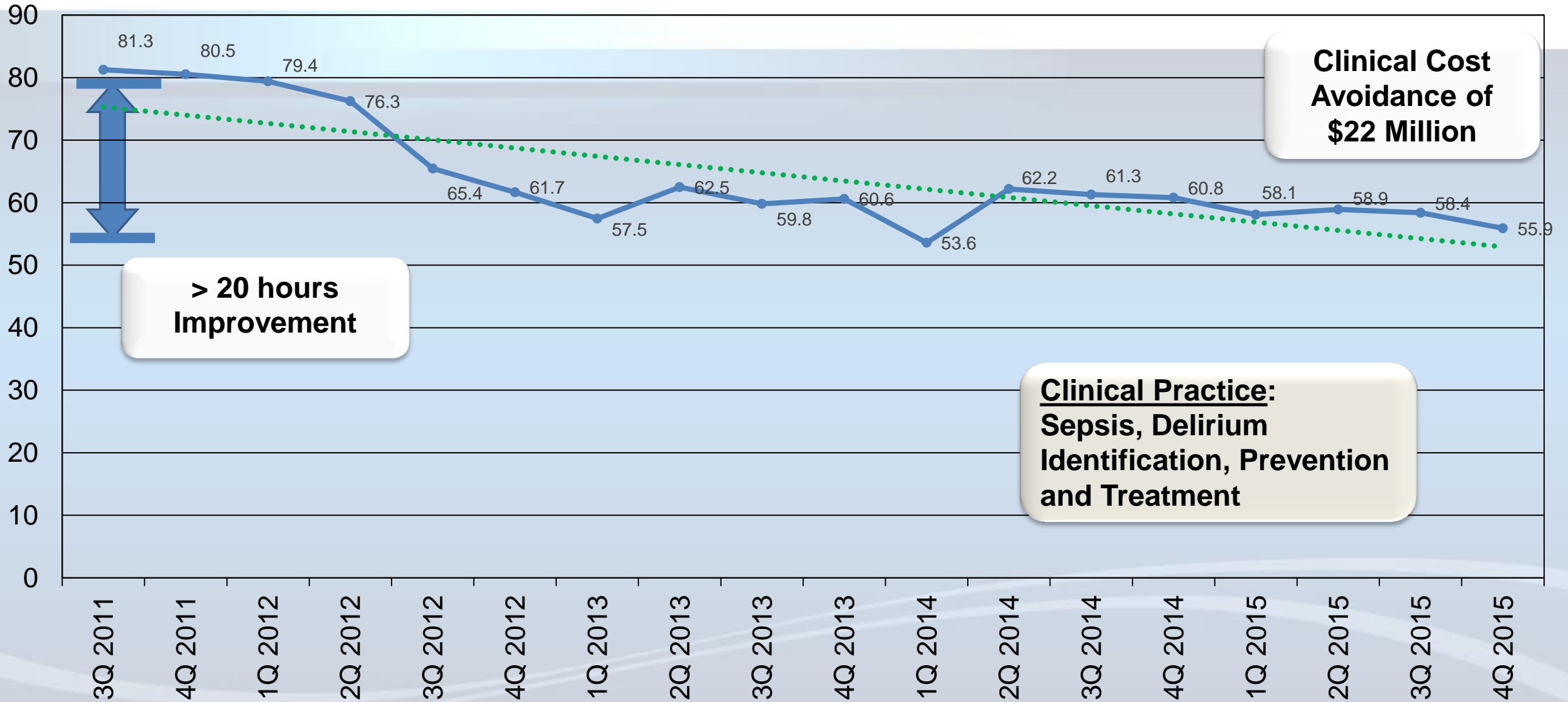
Clinical Practice: Sepsis, Delirium Identification, Prevention and Treatment

Length of Stay in Hours at ICU Level of Care



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Intensive Care Patients



Clinical Cost Avoidance of \$22 Million

> 20 hours Improvement

**Clinical Practice:
Sepsis, Delirium
Identification, Prevention
and Treatment**

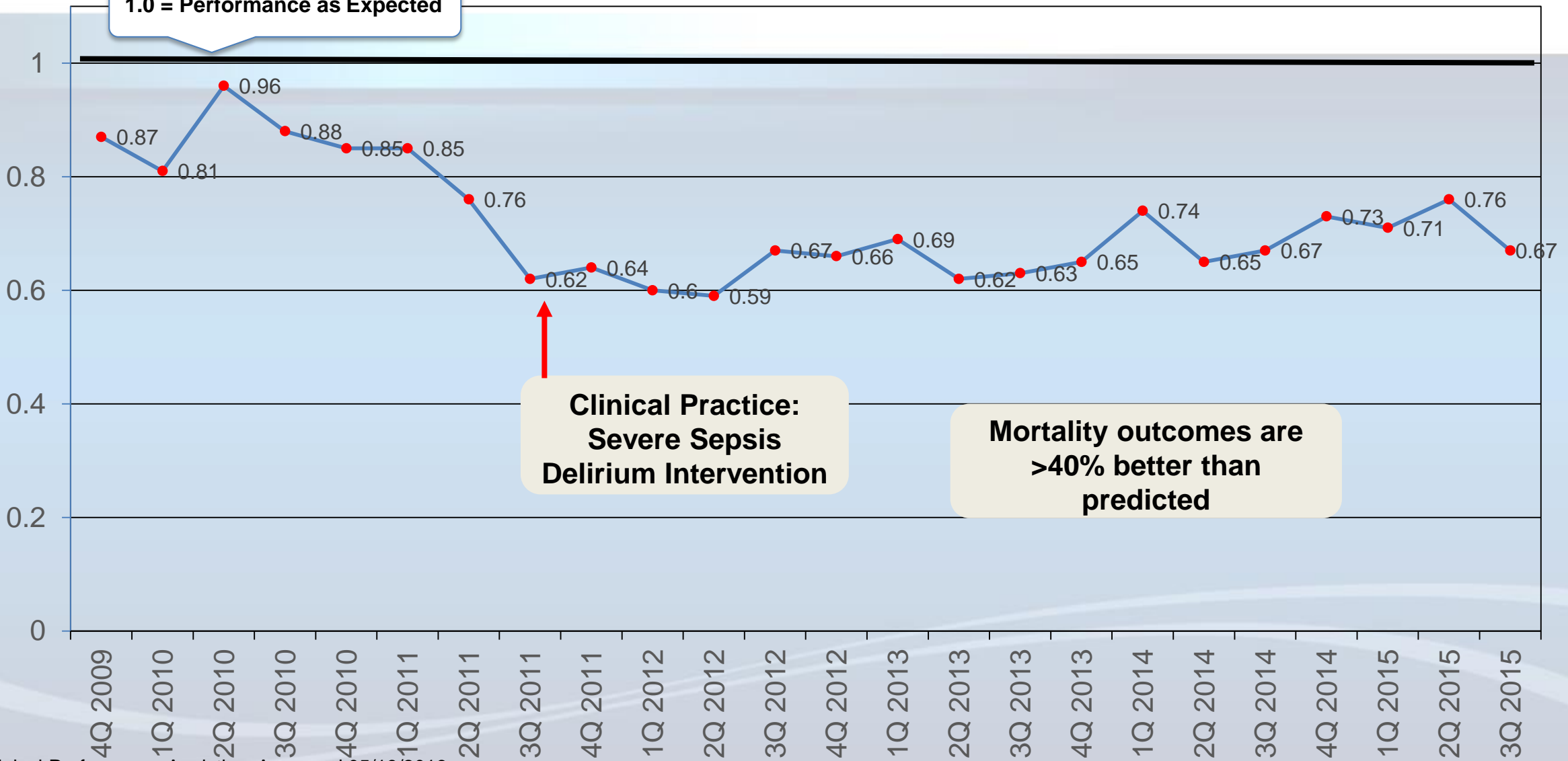
Mortality Observed/Expected



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All ICU Acute Care Patients

1.0 = Performance as Expected



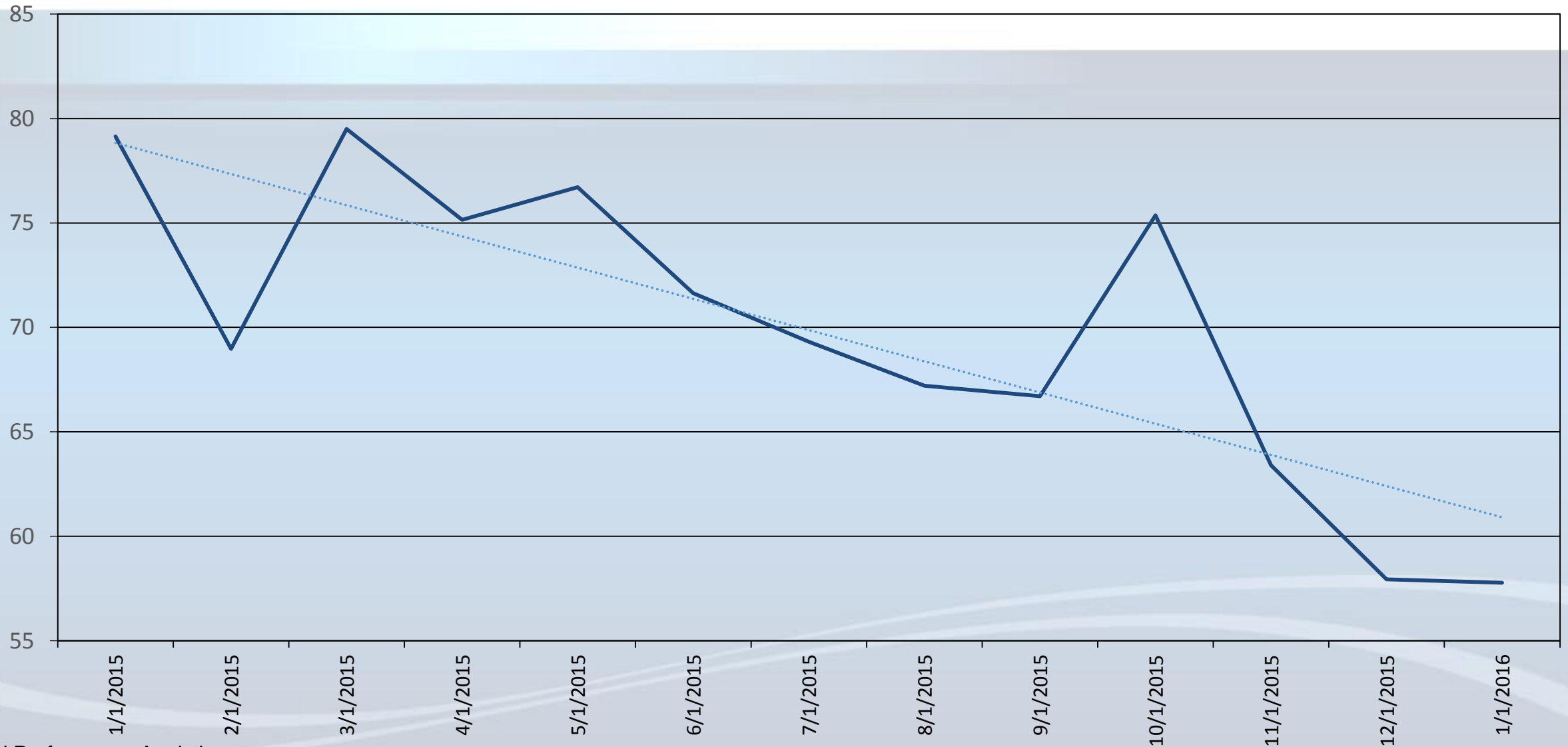
**Clinical Practice:
Severe Sepsis
Delirium Intervention**

**Mortality outcomes are
>40% better than
predicted**

Skilled Nursing Days Reduction Per 1000 Members



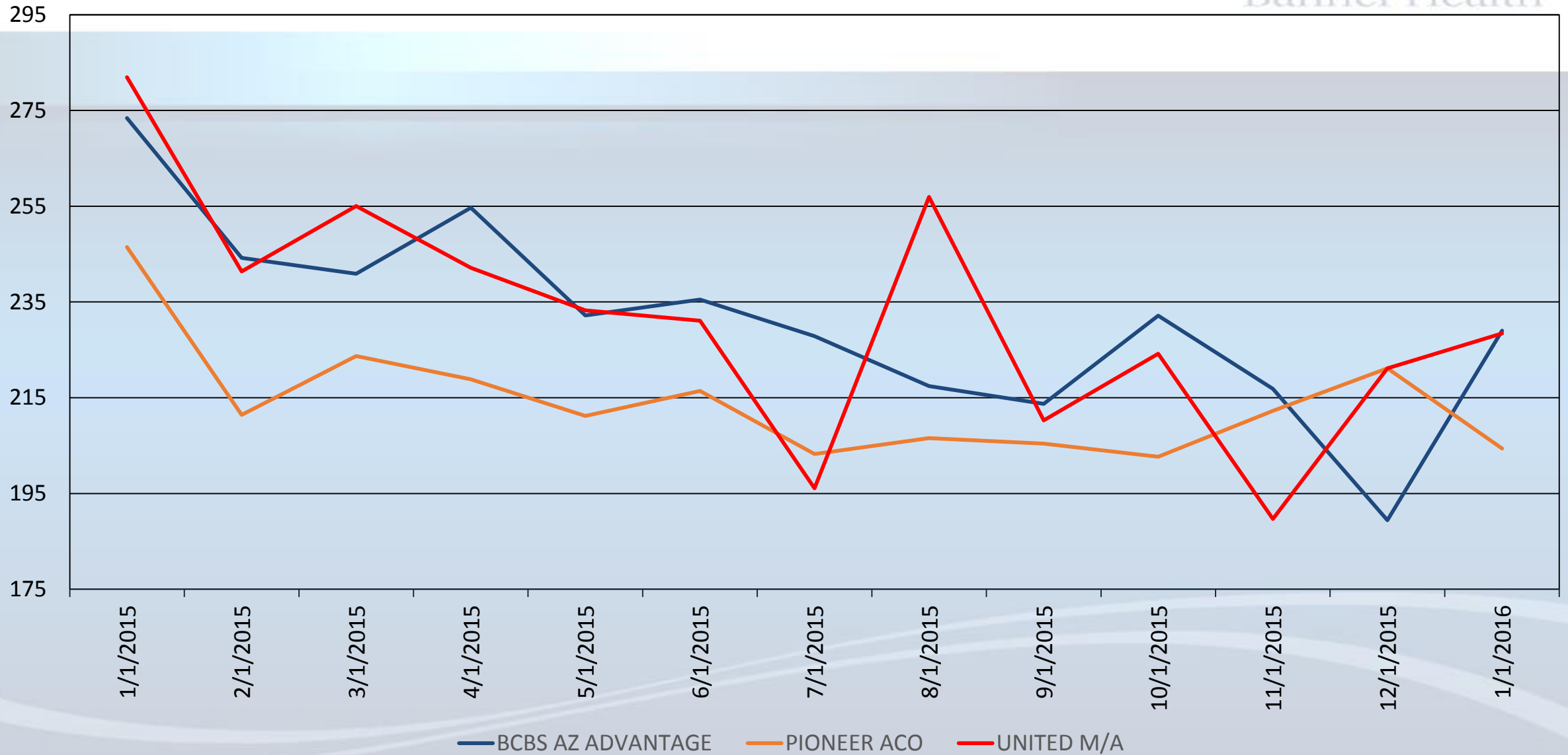
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BHN Inpatient Days Reduction Per 1000 Members



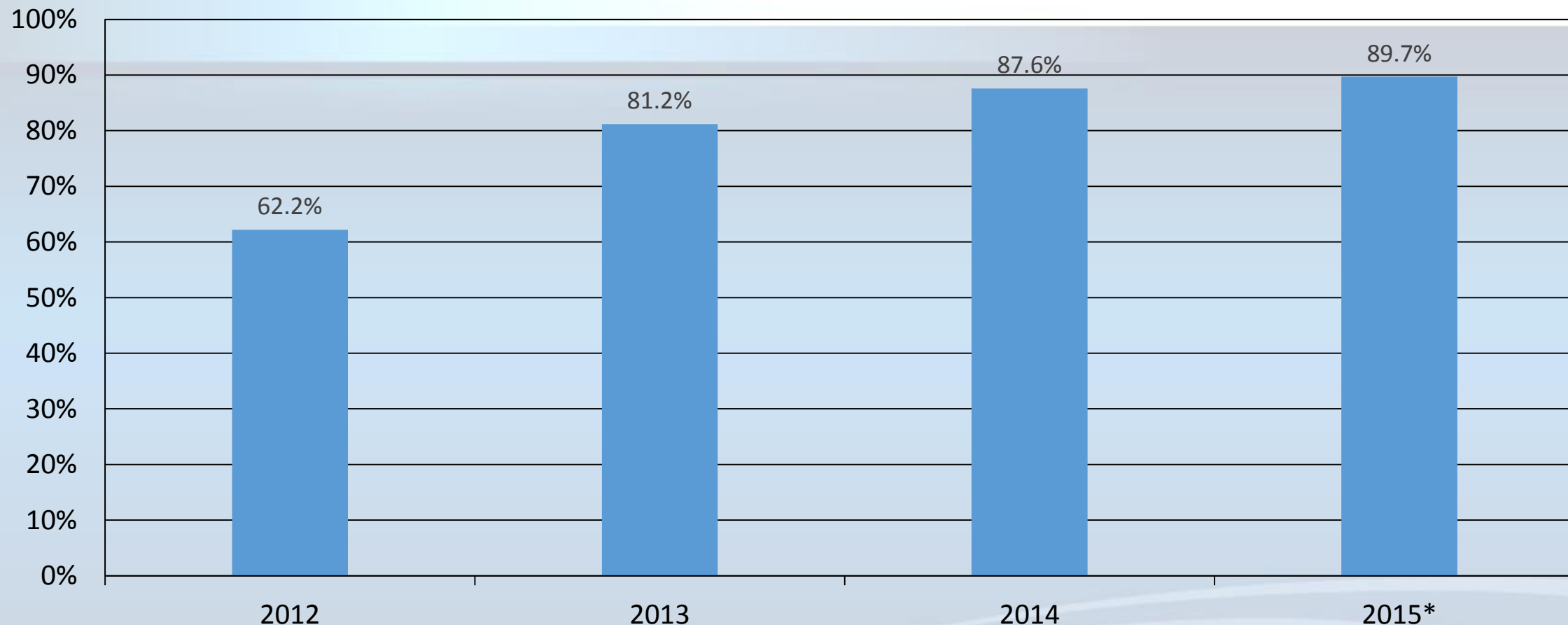
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Pioneer ACO Quality Performance

Overall Quality Score – Maximum 100 per CMS



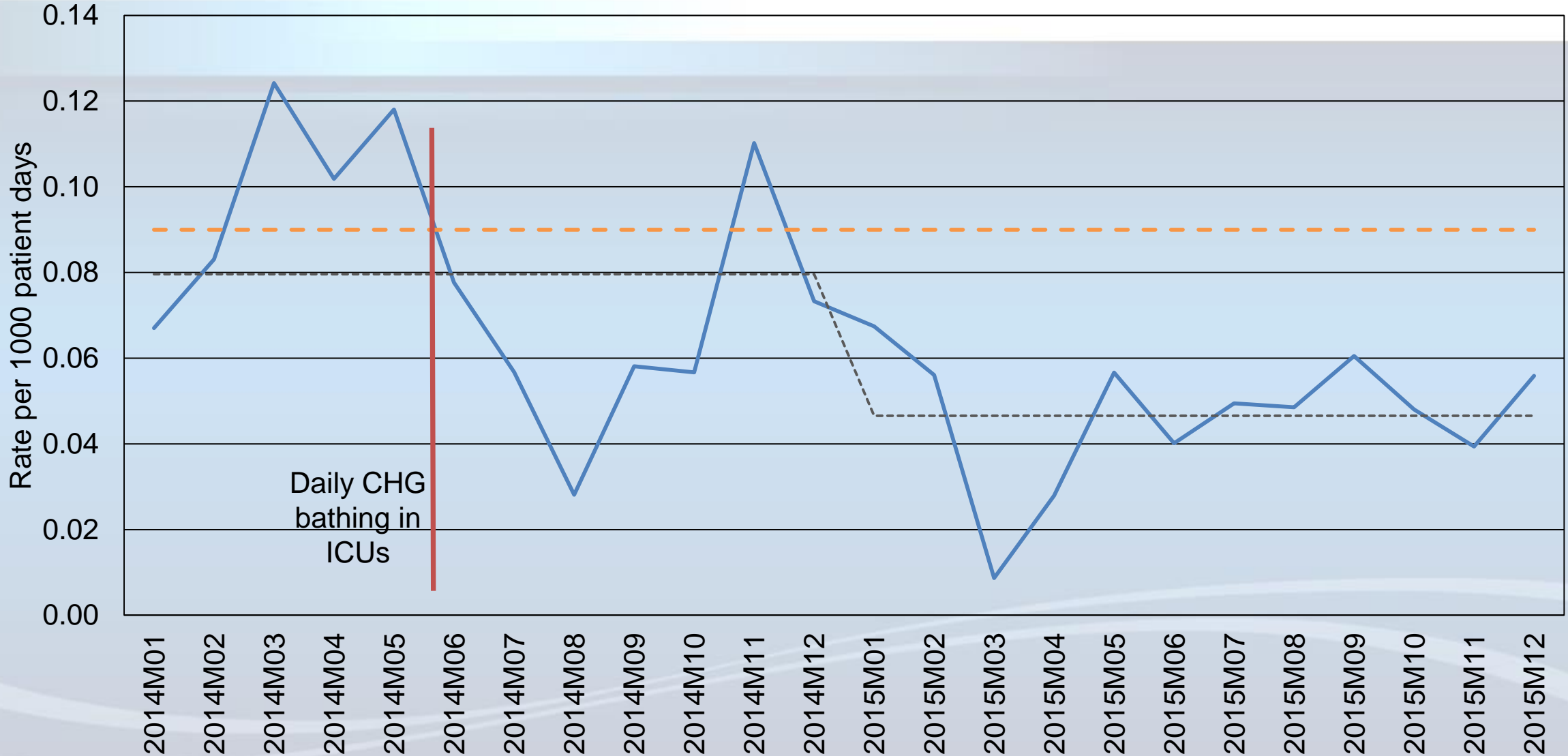
- 1st in cost savings total in the country (!) at \$29M,
- 3rd in the country in savings per beneficiary (\$550)
- 2015 Performance is Projected
- Note: Our membership is one of the largest in US (>52k) and our physician network is the 3rd largest

MRSA Bacteremia Rate Reduction with Bathing Redesign



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— MRSA Bacteremia - - - - Mean - - - - Target



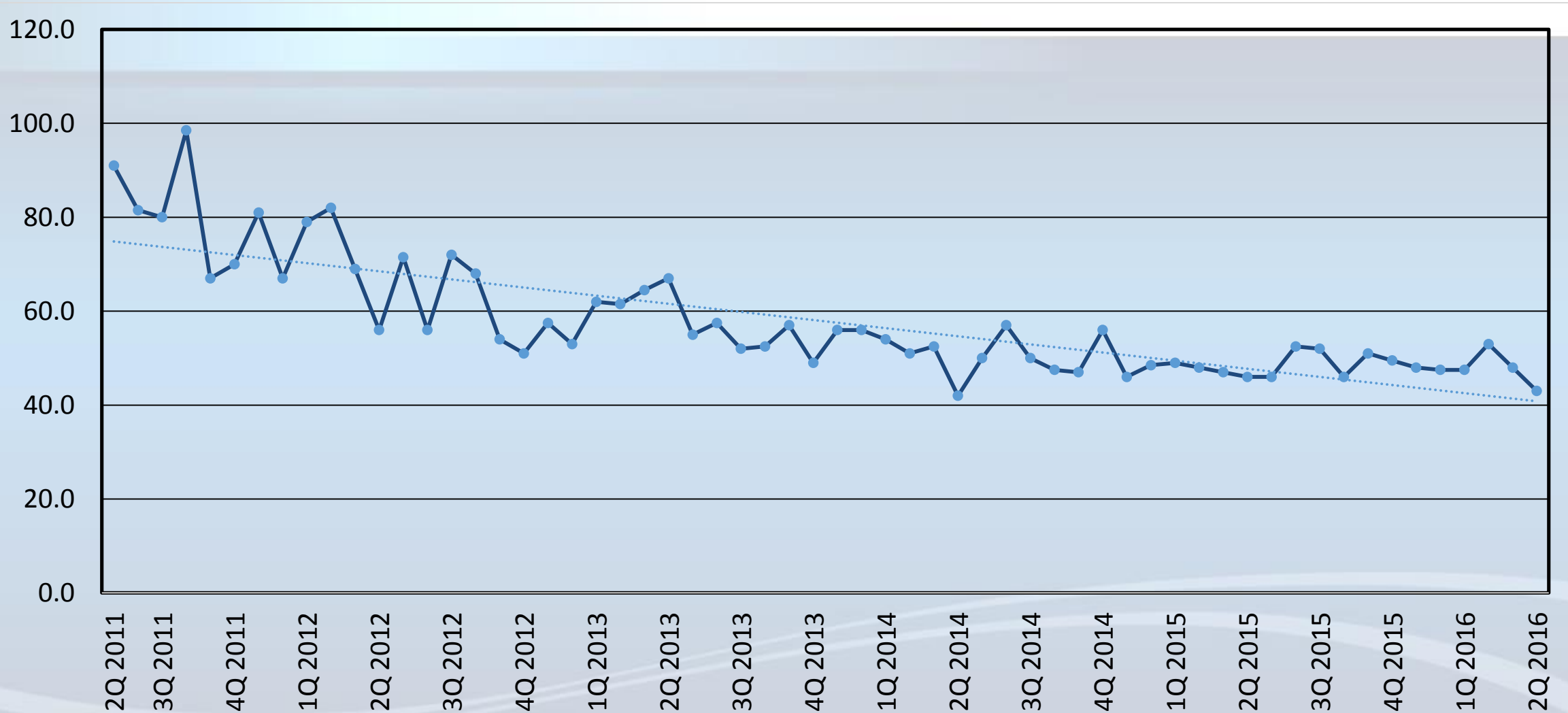
Daily CHG
bathing in
ICUs

Primary Stroke

Minutes to Intravenous Thrombolytic Therapy Times - Median



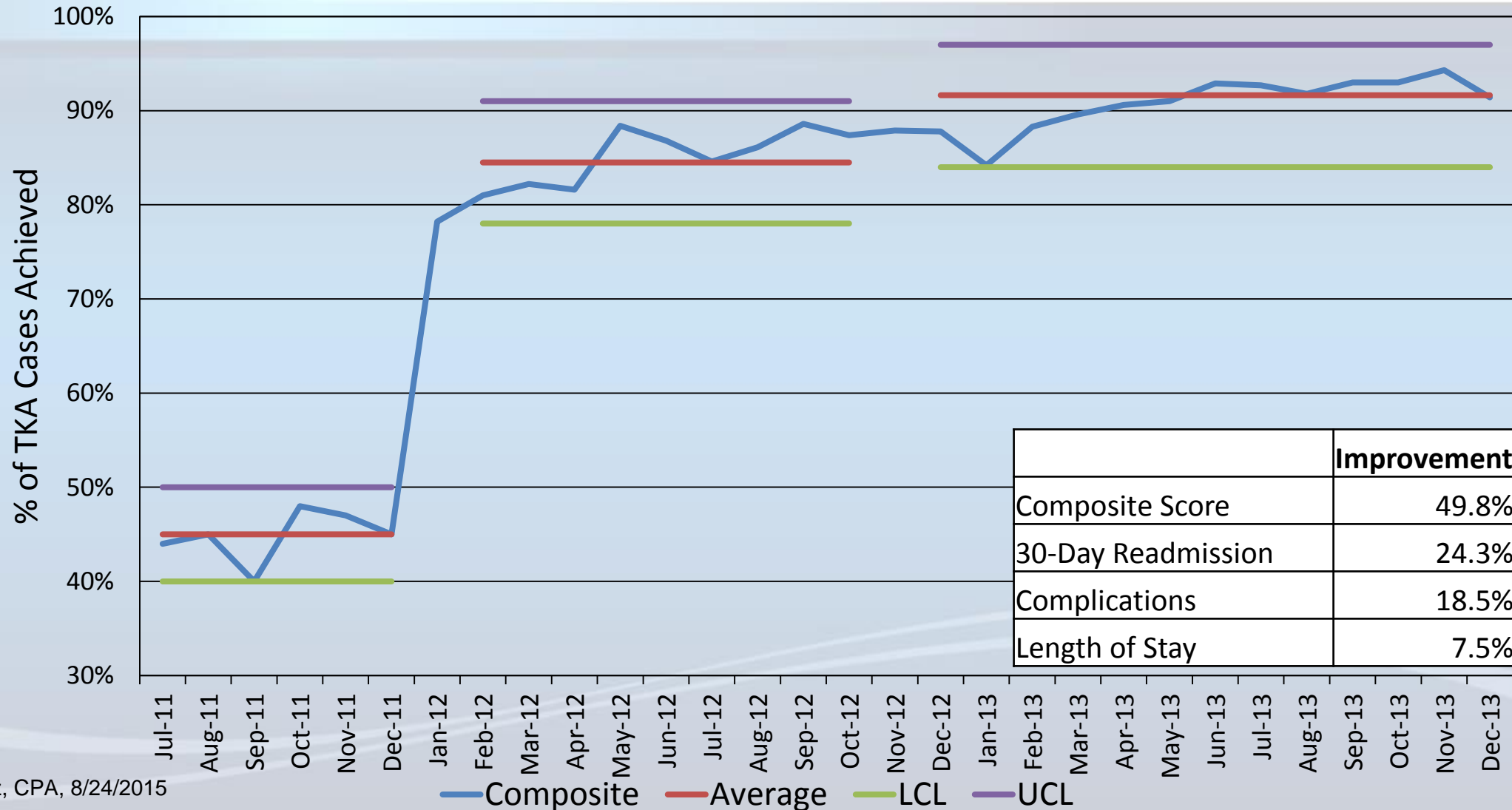
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Total Knee Arthroplasty Care Composite

Catheter Avoidance and Day 0 Ambulation



	Improvement
Composite Score	49.8%
30-Day Readmission	24.3%
Complications	18.5%
Length of Stay	7.5%