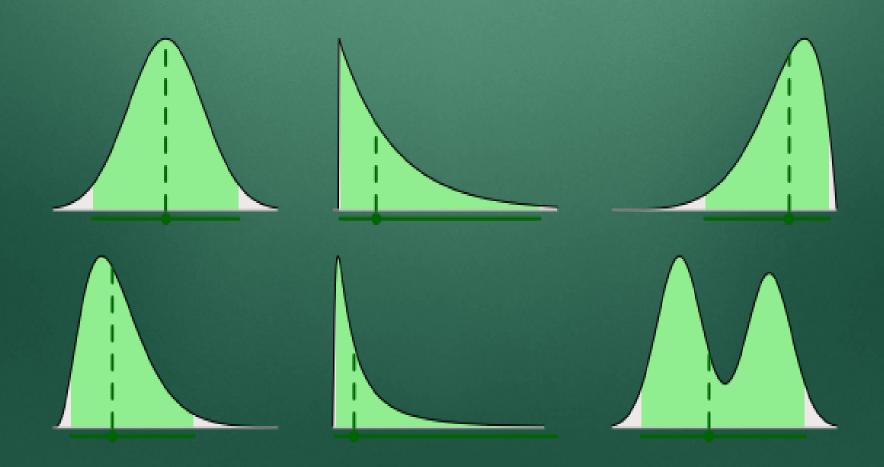
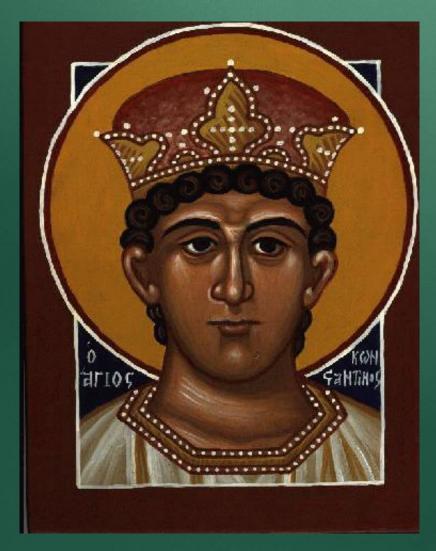
Outcomes Variation and Healthcare Evolution ICHOM

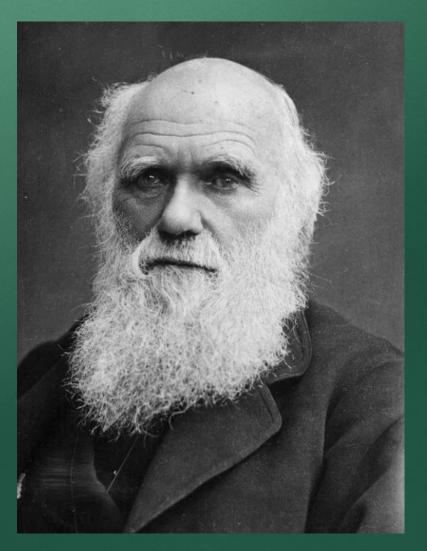
May 16, 2016

BCG



Variation - Friend or Foe





THE BOSTON CONSULTING GROUP

Variation in Procedures and Health Care Spend

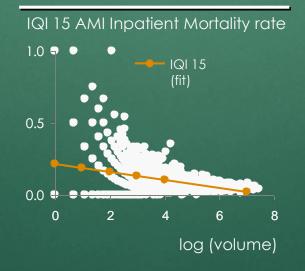


We examined variation in health outcomes

Collect raw data



Correct for low-volume noise



Correct for statistical noise by using a Bayesian shrinkage estimator, that leverages the strongly observed volumeoutcome curve

Risk-adjustment

Population factors

Co-morbidities

Health System factors

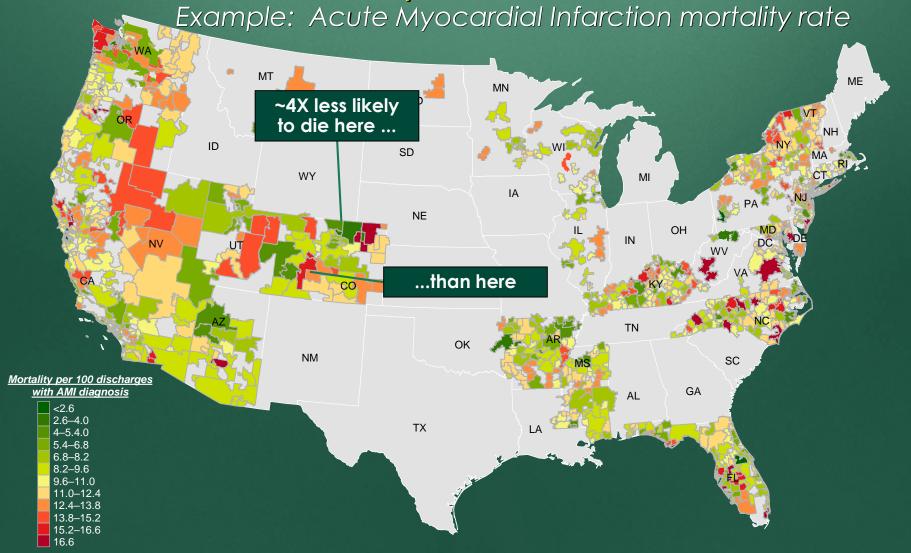
Step-by-step risk-adjustment considering nearly 100 distinct factors across population (demographic and socioeconomic), patient comorbidities, and health system factors

validated health outcomes for which geographically identifiable data is publically available (~50% of US)

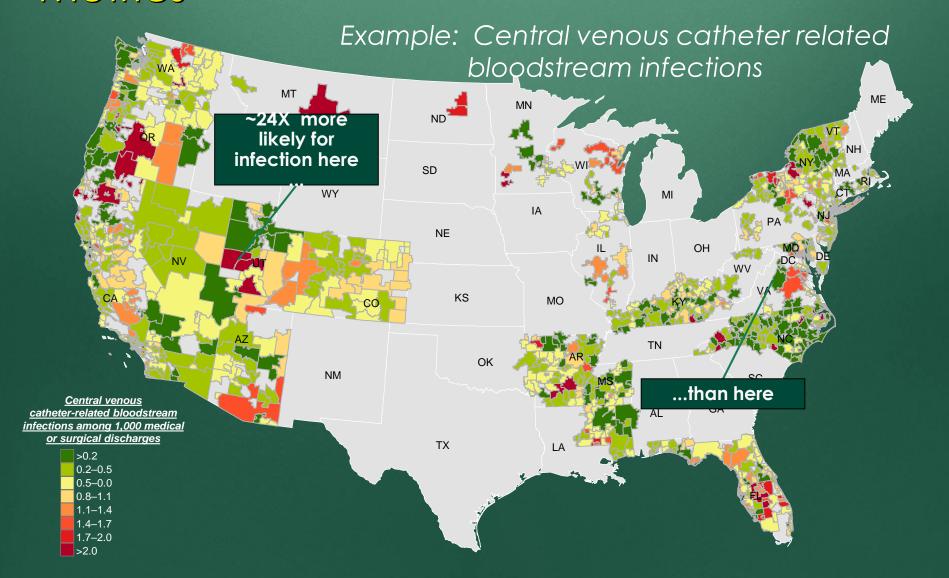
Examine raw variation for 24

distinct AHRQ & NQF

Outcome variability exceeded that of costs



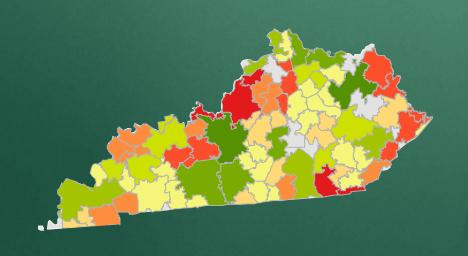
The outcome variability 2-61x across 24 metrics

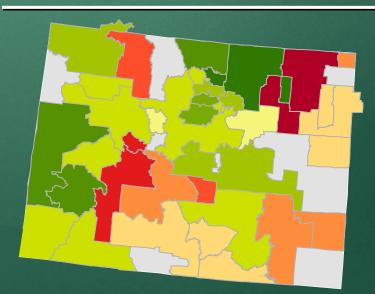


Adjusted AMI mortality rate variation

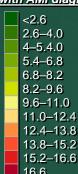


Colorado





Mortality per 100 discharges with AMI diagnosis



In-hospital deaths per 100 hospital discharges with acute myocardial infarction (AMI) as a principal diagnosis for patients ages 18 years and

The Boston Consulting Group

Outcomes variability exists between hospitals within individual metropolitan areas



New York City

Los Angeles

Denver



HOLLYWOOD



Hospitals

56

19

11

AMI Mortality Range

2-16%

1 - 16%

4 – 9%

CHF Mortality Range

1-7%

1 – 8%

1-6%

Pneumonia Mortality Range

2-8%

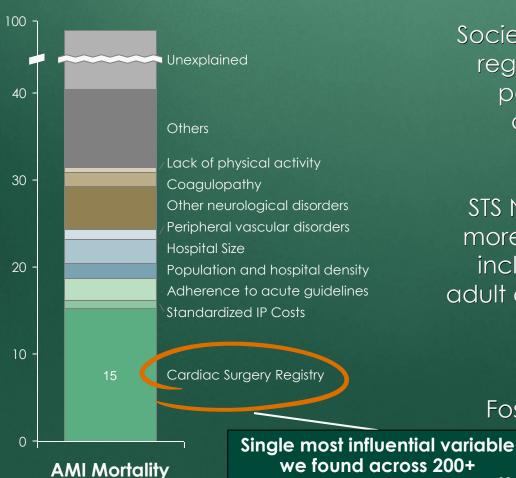
1 - 8%

2-6%

Choosing between hospitals in a city may result in substantially different health outcomes

Data transparency and quality improvement efforts can influence health outcomes





Society of Thoracic Surgeons (STS) registry has developed quality performance measures for cardiothoracic surgeons

STS National Database contains more than 5.8M surgical records; including more than 90% of all adult cardiac surgery centers in the US

Fosters culture of quality and

Single most influential variable

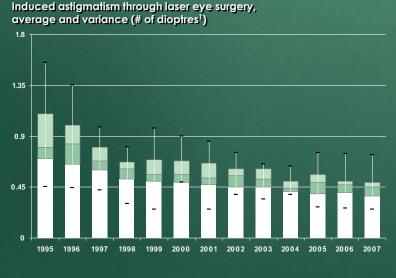
we found across 200+
variables for AMI p < 1.0x10⁻³²

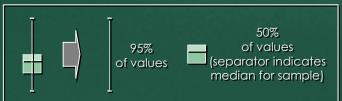
Fosters culture of quality and
ntability, focus on evidencebased medicine

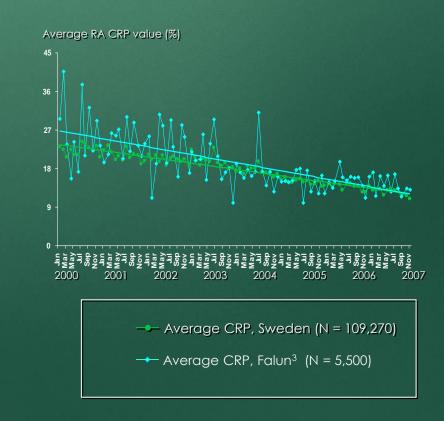
Outcomes measurement reduces variation

Less side-effects (astigmatism) in laser eye surgery over time <u>and</u> lower variance

Significantly lower inflammation levels for rheumatoid arthritis patients <u>and</u> lower variance in outcomes



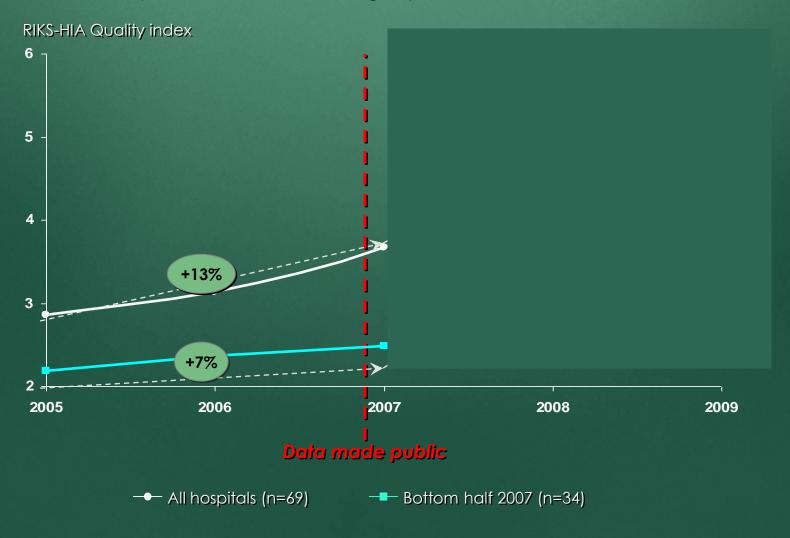




1. Dipotre = measured as average change of dioptre per clinic based on individual patient data 2. CRP-C = reactive protein level in blood indicating level of inflammation. Lower level of CRP indicate lower level of inflammation short-term as well as lower risk for inflammation long-term 3. National coverage 56% while Falun coverage is 100% for all types of RA-patients. Since 1997 Falun has measured and followed-up all its RA-patients on a monthly basis. Data has been used for regional quality work. Source: Cataract Annual Report 2007; RA Annual Report 2008-09

Outcomes transparency improves compliance

Example: Swedish myocardial infarction registry



Lower variation and higher survival in Sweden

		Articles
Acute myocardial infarction: a	comparison of short-term	@ [†] _
Sheng Chia Chung, Rdf Gedeborg OwenNichol as, Stefan James, Anders, John Deanfield, Adam Timmis, Tomas Jernberg, Harry Hemingway	3	Oa ************************************
assessed time trends for care and outcomes in Sweden and Methods We used data from national registries on cons hospitals providing care for acute coronary syndrome in	ecutive patients registered between 2004 and 2010 in all Sweden and the UK. The primary outcome was all-cause tess of treatment by indirect casemis standardisation. This	Published Online January 23, 2014 http://dx.doi.org/10.2016/ Son.go.6/jfs/11/6/20/2X Son.go.6/jfs/11/6/20/2X Son.go.6/jfs/11/6/20/2/6/- Son.go.6/jfs/11/6/20/2/6/- Son.go.6/jfs/11/6/20/2/6/- Copyright Offwar, et al. Open
Findings Wi 7-4-7-7) In defined by mellitus su of primary w 7850, Afi	6 CI ups etes uke 19% 45), i CI	Access article distributed under the terms of CE BP AC NO Far Institute of Health Information Breach at UCL Partners (S C C Noug PhO, Prof II Hemispay (FEO), National Institute for Clinical Outcomes Breach (O Nichola PhO), and Centre for Cardiovanesian
1-38-1-58 I Interpretation	ICET and	and Outcomes (Prof.) Described FRCP ₃ University College London, London, LK, Uppsala Clinical Bessarch Centre (R. Cariborghi, S. James M.Q. Prof.) Wallestin M.D. and Department of Medical Sciences, Cariborghi, Spring,
Introduction Recognition is growing of the need for comparative Recognition is growing of the need for comparative Recognition is growing of the department of the control	immediate posential so improve outcomes than treatment introvations. Imperational comparison of whole health-care delivery systems, therefore, might yield imporant, actonable intestights so guide development of politics and clinical practice. International comparable effects eners research for acuse myocardial infarction has had three main furnations. First is a lack of comparation of whole health	Prof. Wallertini, Upprada University, Upprada, Swedere, Department of Michicolar and Ginical Madician, Institute of M. edicina, Sahigunnia. A. caderay, University of Gothenburg, Gothenburg, Sweden (Prof. J.) proposed MD; Department of Canforthenoic Surges, Sahigunnia University Hospick Gothenburg, Sweden
are lacking. The Institute of Medictine identified health- care delivery systems and cardiovacular care as among the highest priorities for comparative effectiveness research." The efficacy of treatments for acuse myocardial infarction has been extensively studied in randomisted trials. Thus uptake and use of these treatments vary within and between the UK (England and Wales) and Sweden." A study in prateries with ST-	systems. Extering studies lack population coverage because they are based on selected samples of hospital patients reported in volumary registrates, "on end in streeps," or traits" thas are known to differ from the national population in resuments and outcomes. "Second, international studies have compared only care' or outcomes' or have been restricted to patients with either STEMI' or not STEMI." Third, attempts have not been on been	(Perl'A) prysocrat; Division of Health and Social Care Binsanch, Kingy College London, London, UK (Perl' Wielle MD; National Institute of Health Divisional Institute of Health Divisional Comprehensive Biomedical Binsanch Centre, (Sey) is 5 thomas MD in Toundation Trust and Engly College London, Lendon, UK
segment-elevation impocardial infarction (STEMI) in IZ European countries repond increasing use of primary percuaneous coronary inservention (PCI) but showed striking differences between countries. American of care systems, including organisational culture, care pathways, and programmes to improve equality, are not assessed in trails but might be associated with outcome. 30-day morality for acuse mycoardial infarction is an imporant indicator of the procurabil infarction is an imporant indicator of	made to sandardise the morality of patients in one country by the casenth in another. As result, there are few studies between health systems from which to set benchmark outcome goals. A crucial fleature of the health systems in Sweden and the UK is that they are the only two countries worldwide that have continuous national clinical registers for cauc- coronasy syndrome with mandaed participation for all hospitals. We compute on of these two countries is	Orof Wolfer, Institute for Oriental Epidemiology and Biometry and Comprohensive Heart-Fallow Canton, University of Wintcheng Worthway, Germany Phanchmarn MO; National Institute for Health Beasard, Biomedia Beasarch Unit, Bart Health London, London, UK (Pord A Timmin HED); and Department of the Riches,

<u>Treatment</u>			
Primary PCI ³	59%	22%	
β blocker at discharge ⁴	89%	78%	
Outcomes ¹			
30-day mortality	7.6%	10.5%	
Standardize d mortality rate ²	1.0	1.37	

1. Acute Myocardial Infarction 2. Mortality rate adjusted for 17 casemix characteristics. 3. Primary PCI (Percutaneous Coronary Intervention) is recommended in guidelines in the USA since 2004 and in Europe since 2005 but did not become UK national policy until October 2008. β blocker at discharge has been recommended in guidelines in the USA and Europe since 1996 and in the UK since 2001, but statin therapy and ACE inhibitors or ARBs are still more commonly prescribed in the UK.

Note: The study period was 2004-2010. Source: Chung et al, The Lancet, Jan 23, 2014

ICHOM standards asset for improvement work

Standard Sets Complete (2013)

- Localized Prostate Cancer
- 2. Lower Back Pain
- 3. Coronary Artery
 Disease
- 4. Cataracts

Burden of Disease Covered

18%

Standard Sets Complete (2014)

- 5. Parkinson's Disease¹
- 6. Cleft Lip and Palate
- 7. Stroke
- 8. Hip and Knee Osteoarthritis¹
- Macular Degeneration¹
- 10. Lung Cancer¹
- 11. Depression and Anxiety¹
- 12. Advanced Prostate Cancer

35%

Conditions in Year Three (2015/16)

- 13. Breast Cancer
- 14. Dementia
- 15. Older Persons²
- 16. Heart Failure
- 17. Pregnancy and Childbirth
- 18. Colorectal Cancer
- 19. Overactive Bladder
- 20. Craniofacial Microsomia
- 21. Inflammatory Bowel Disease

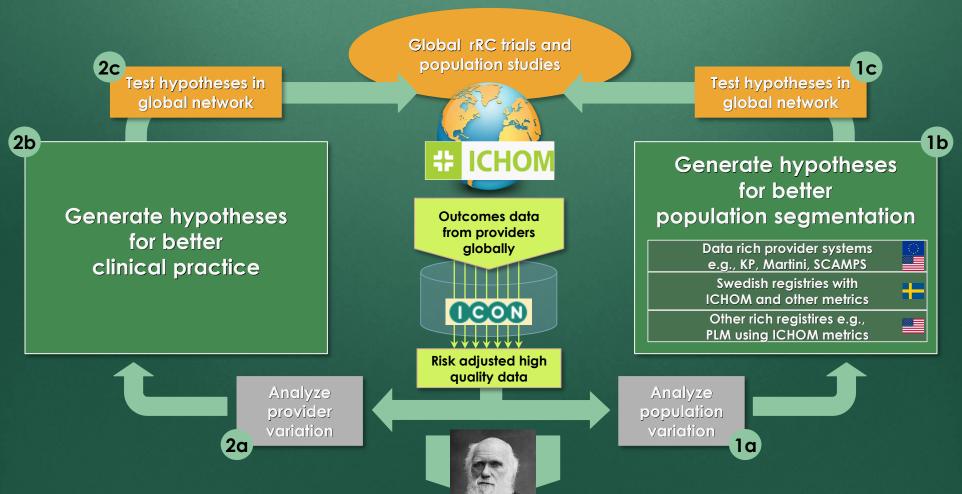
45%

Under Consideration for 2016/17

- 22. End Stage Renal Failure
- 23. Oral Health
- 24. Brain Tumors
- 25. Drug and Alcohol Addiction
- 26. Bipolar Disorder
- 27. Burns
- 28. Melanoma
- 29. Head and Neck Cancer
- 30. Pediatric Oncology (Condition(s) TBD)
- 31. Rheumatoid Arthritis
- 32. Liver Transplantation
- 33. Congenital Hand Malformations
- 34. Chronic Rhinosinusitis
- 35. Congenital
 Hemolytic Anemia
- 36. Rotator Cuff Disease
- 37. Malaria

%

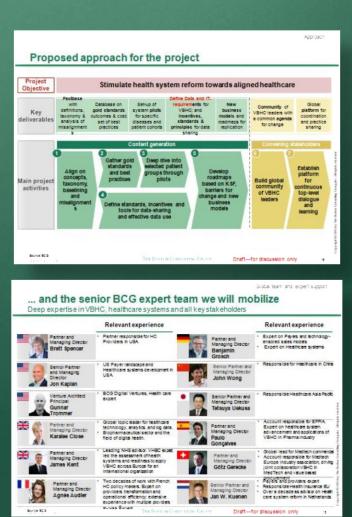
Ecosystem for Healthcare system evolution



Selection principle for Healthcare systems evolution

Value in healthcare – new two year program







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Thank you