

Supplementary Online Content

Sheetz KH, Chhabra KR, Smith ME, Dimick JB, Nathan H. Association of discretionary hospital volume standards for high-risk cancer surgery with patient outcomes and access, 2005-2016. *JAMA Surg*. Published online August 14, 2019. doi:10.1001/jamasurg.2019.3017

eFigure 1. Overall Risk-Adjusted Outcome Rates by Procedure for all Patients in the Study Cohort.

eFigure 2. Risk-Adjusted Complication Rates by Procedure for Hospitals Meeting and Not Meeting the Volume Standards.

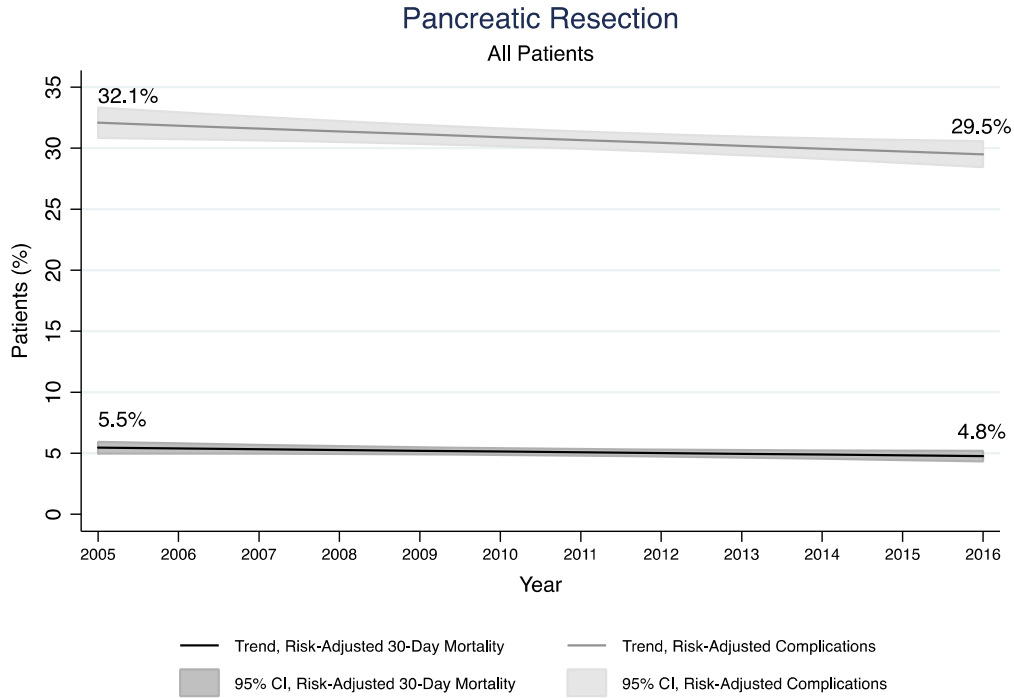
eFigure 3. Regional Availability of Any Hospital Meeting the Leapfrog Volume Standards.

eTable. Risk-Adjusted Outcomes for the Lowest and Highest Volume Hospitals, 2013-2016.

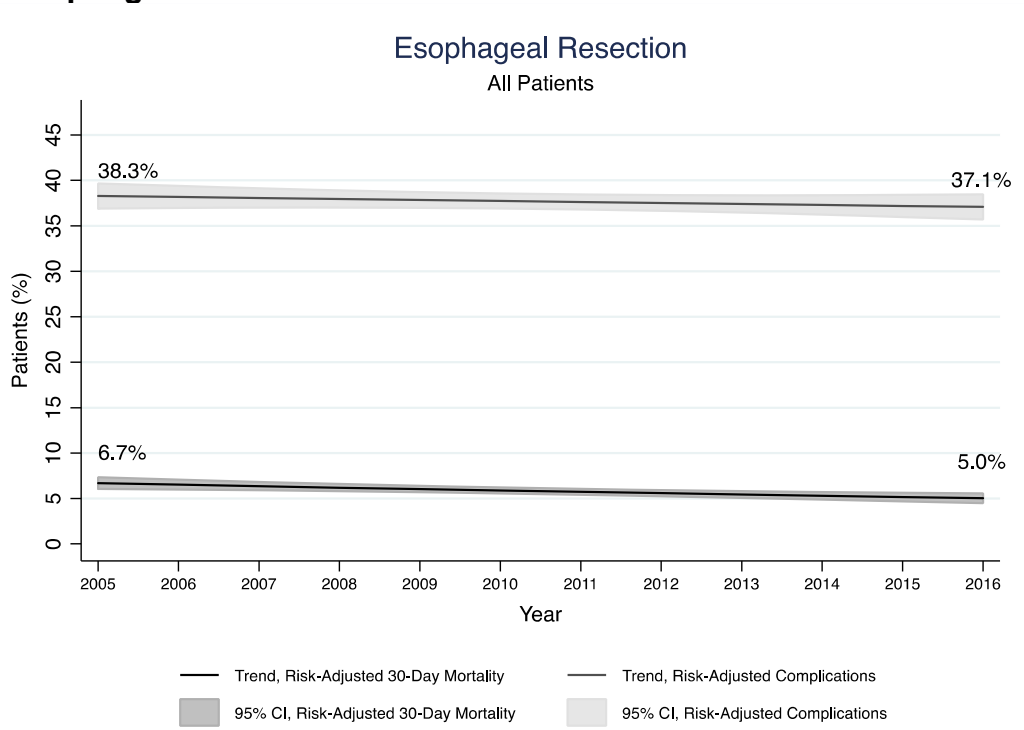
This supplementary material has been provided by the authors to give readers additional information about their work.

eFigure 1. Overall risk-adjusted outcome rates by procedure for all patients in the study cohort.

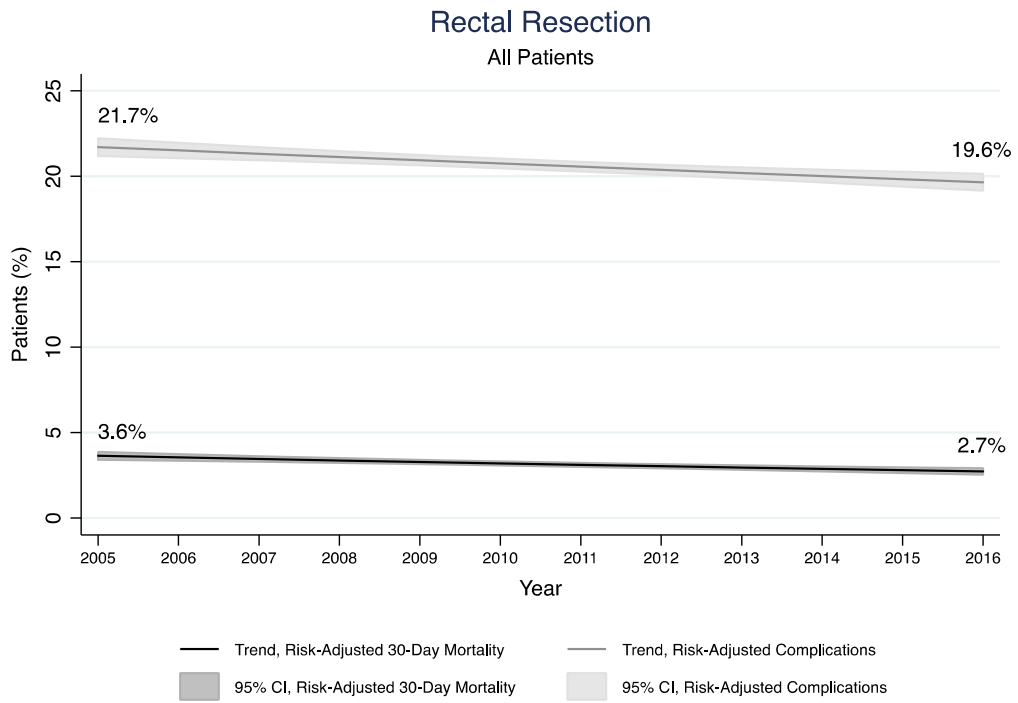
A. Pancreatic Resection



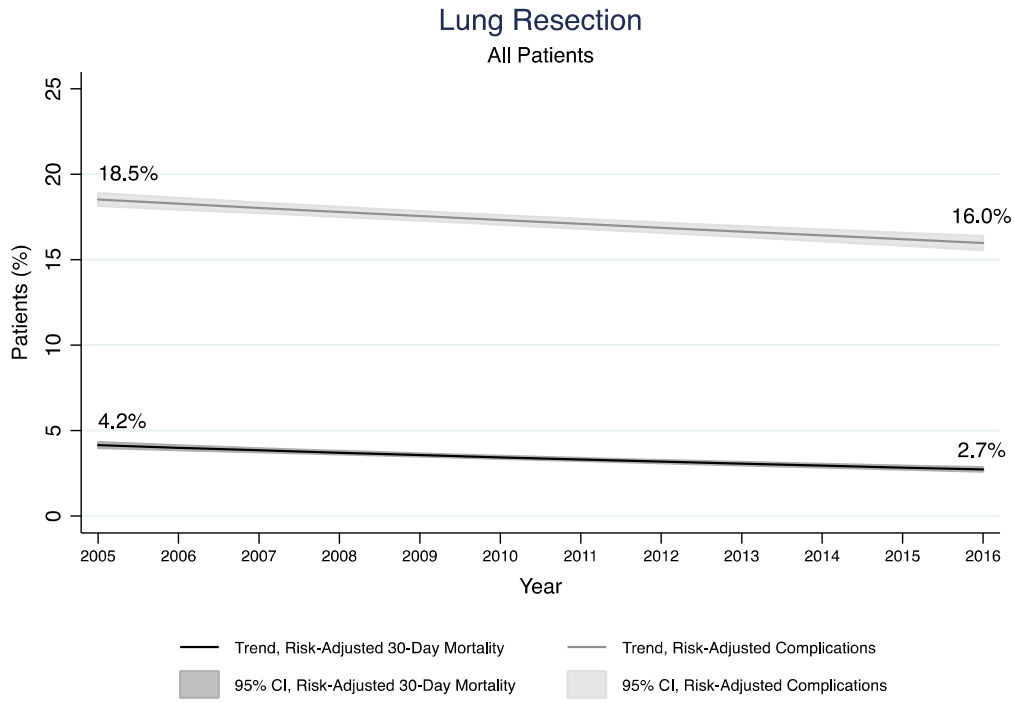
B. Esophageal Resection



C. Rectal Resection

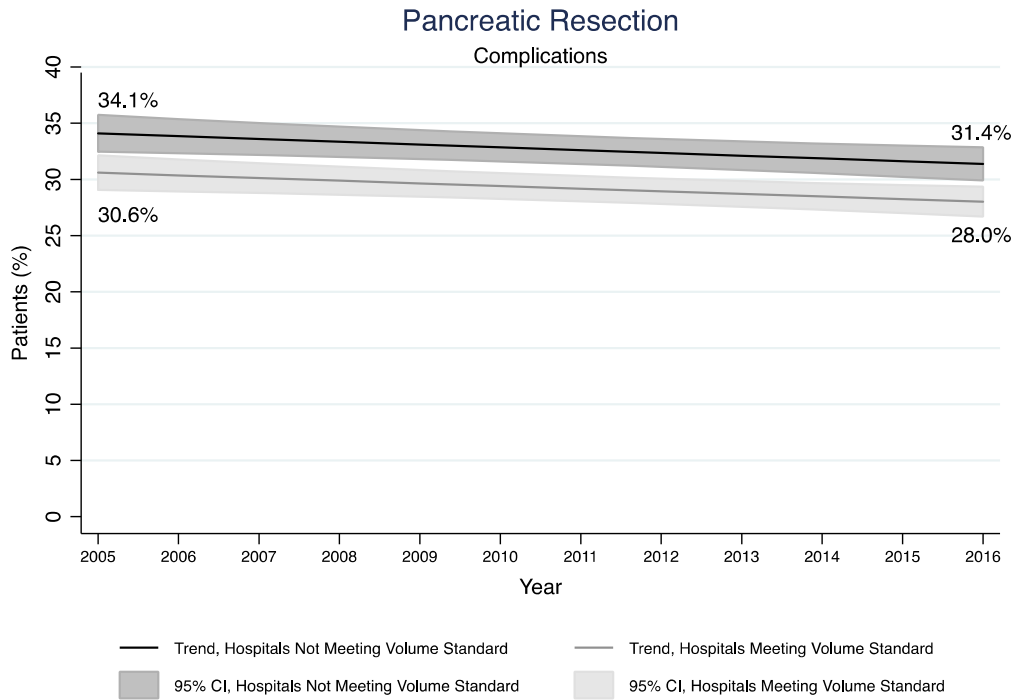


D. Lung Resection

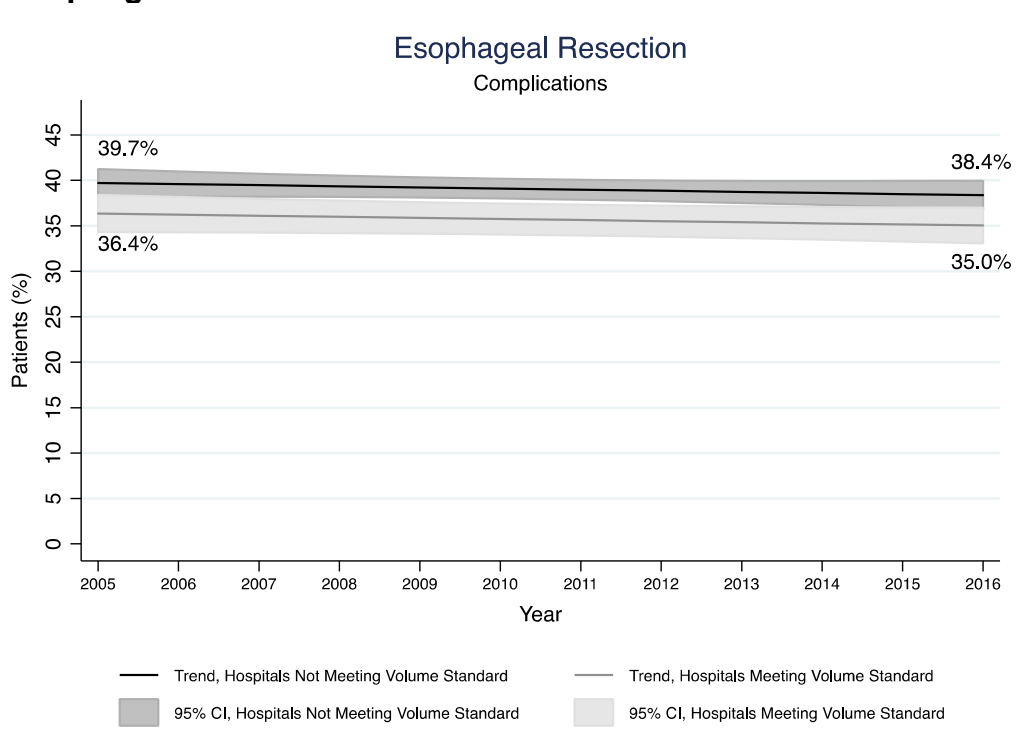


eFigure 2. Risk-adjusted complication rates by procedure for hospitals meeting and not meeting the volume standards.

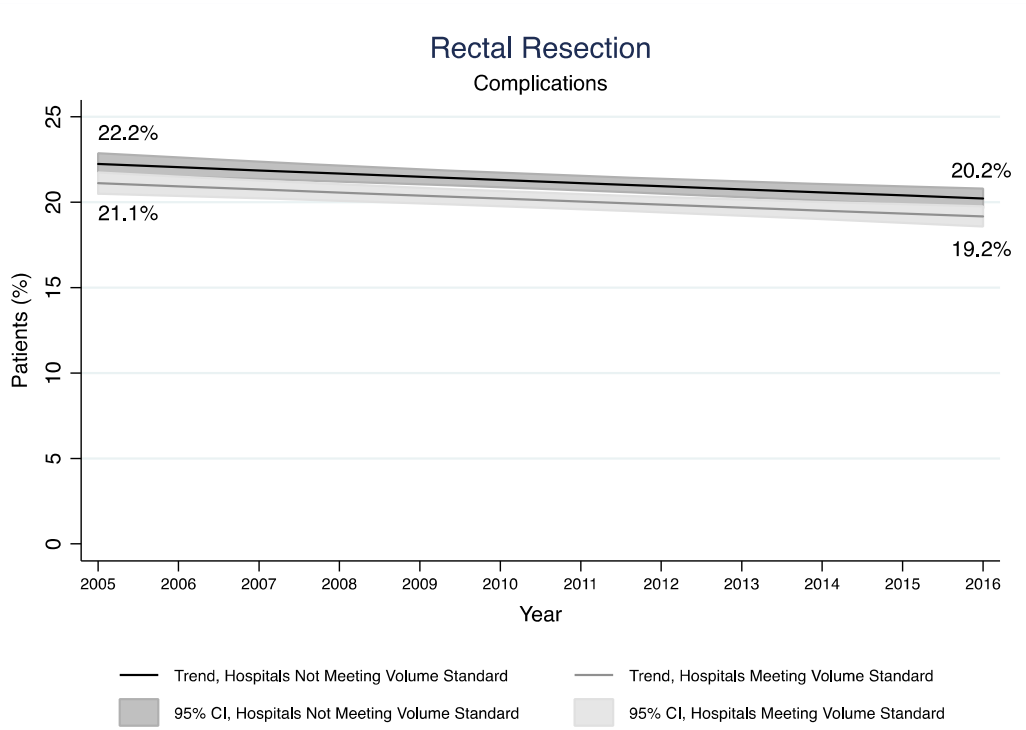
A. Pancreatic Resection



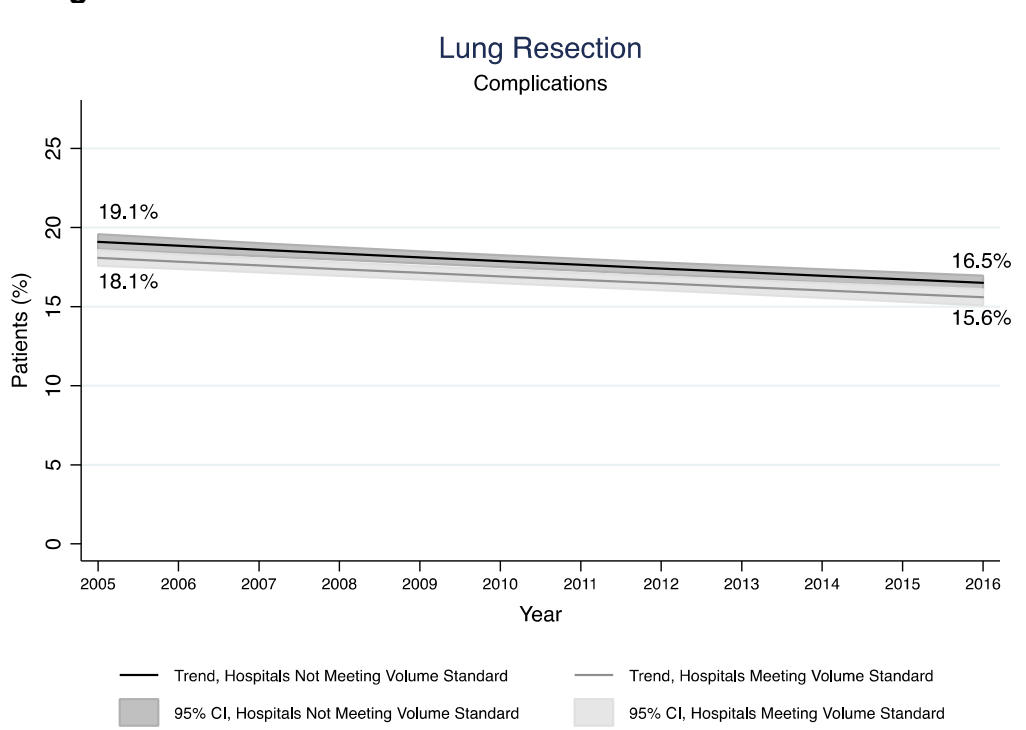
B. Esophageal Resection



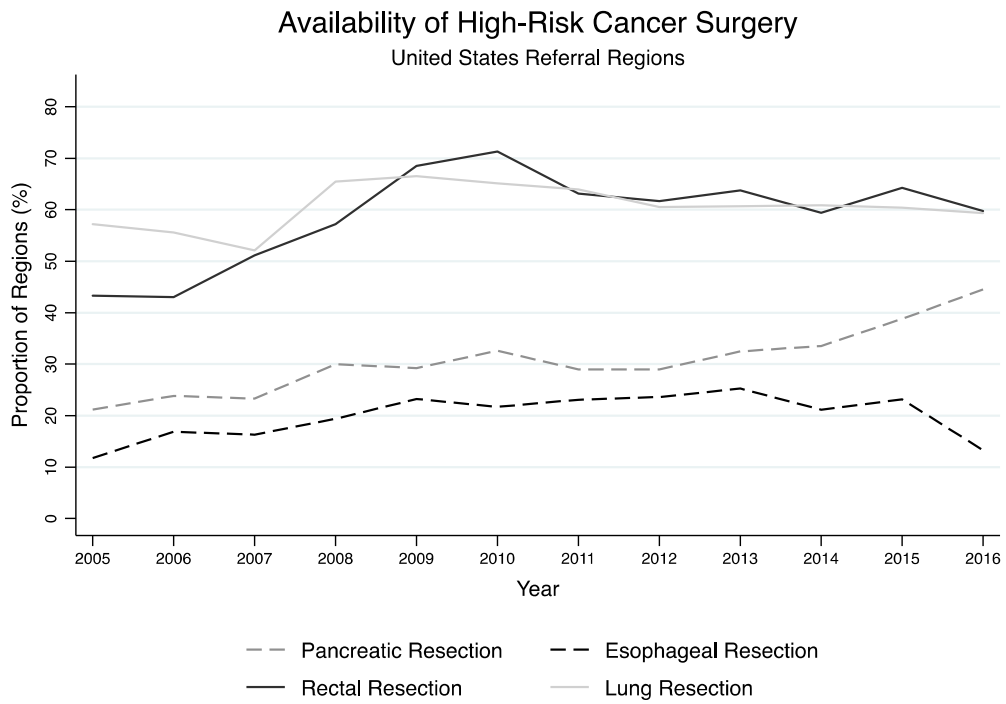
C. Rectal Resection



D. Lung Resection



eFigure 3. Regional availability of any hospital meeting the Leapfrog volume standards.



eTable. Risk-adjusted outcomes for the lowest and highest volume hospitals, 2013-2016.

Procedure	Lowest Volume Hospitals	Highest Volume Hospitals	Absolute Difference	Adjusted Odds Ratio ¹
Pancreatic resection				
Complications (%)	35.9	29.1	-6.8	0.69
95% CI	(34.0, 37.8)	(26.1, 32.0)	(-10.6, -3.1)	(0.55, 0.85)
Esophageal resection				
Complications (%)	41.2	37.5	-3.7	0.83
95% CI	(38.7, 43.7)	(33.8, 41.1)	(-8.8, 1.3)	(0.64, 1.07)
Rectal resection				
Complications (%)	22.6	19.8	-2.8	0.81
95% CI	(21.5, 23.6)	(18.6, 21.0)	(-4.5, -1.0)	(0.71, 0.92)
Lung resection				
Complications (%)	18.7	15.6	-3.1	0.76
95% CI	(17.9, 19.5)	(14.1, 17.0)	(-5.1, -1.2)	(0.63, 0.91)

Notes: ¹Lowest volume hospitals are baseline. Lowest volume hospitals reflect the quintile (20%) with the lowest annual volume. Highest volume hospitals reflect the quintile (20%) with the highest annual volume.