

## eAppendix

**Table 1.** Outcome, Quality and Patient Satisfaction Measures Specification

<b>Selected Measures</b>	<b>Descriptions</b>
<b>Health Outcomes</b>	
Mortality	Risk-adjusted 30-day mortality rate
Readmission	Risk-adjusted 30-day readmission rate
<b>Clinical Performance</b>	
Acute treatment performance	Antithrombotic therapy by end of hospital day 2
Inpatient management performance	Deep vein thromboembolism prophylaxis
	Assessed for rehabilitation
Secondary prevention performance	Discharge on thrombolytic therapy
	Discharged on cholesterol-reducing medication
	Stroke education
<b>Patient satisfactions</b>	
Global Satisfaction	Recommend the hospital
Satisfaction with environment	Hospital cleanness
	Hospital quietness
Satisfaction with communication	Communication with nurses
	Communication with doctors
	Communication of medicine
Satisfaction with pain control	Pain control
Satisfaction with responsiveness	Responsiveness of hospital staff
Satisfaction with discharge information	Discharge information
Satisfaction with care transition	Care transition

<sup>a</sup>Clinical performance measures were selected from the “timely and effective care” domain of CMS hospital compare data. “Intravenous thrombolytic therapy” and “patients with atrial fibrillation receiving anticoagulation therapy” were not included due to a large proportion (>50%) of missing data.

**Table 2.** Full regression results of patient satisfaction on risk-adjusted 30-Day Mortality and Risk-Adjusted 30-Day Readmission

Explanatory Variables	Risk-adjusted 30-day stroke mortality rate		Risk-adjusted 30-day stroke Readmission rate	
	Beta (SE) N=2530	P value	Beta (SE) N=2530	P value
<b>INTERCEPT</b>	14.33 (0.99)	<0.001	13.6 (0.66)	<0.001
<b>COVARIATES</b>				
<b>Rural</b>	0.31 (0.11)	0.006	-0.25 (0.07)	0.001
<b>Teaching</b>	0.42 (0.08)	<0.001	0.23 (0.05)	<0.001
<b>Hospital Ownership</b>				
Non-for Profit	-0.27 (0.10)	0.008	0.09 (0.07)	0.18
For Profit	-0.29 (0.12)	0.02	0.11 (0.08)	0.16
Other	-1.00 (0.74)	0.18	0.12 (0.49)	0.80
Public	Reference	-	Reference	-
<b>Hospital Size</b>				
Small	-0.23 (0.10)	0.02	-0.26 (0.07)	<0.001
Middle	-0.05 (0.08)	0.53	-0.18 (0.05)	0.001
Large	Reference	-	Reference	-
<b>Regions</b>				
Midwest	0.30 (0.11)	0.007	-0.33 (0.07)	<0.001
South	0.59 (0.11)	<0.001	-0.22 (0.07)	0.003
West	0.65 (0.12)	<0.001	-0.66 (0.08)	<0.001
Northwest	Reference	-	Reference	-
<b>Registered Stroke Center</b>	-0.09 (0.08)	0.29	0.08 (0.05)	0.15
<b>DSH Patient Percent</b>	-0.36 (0.25)	0.16	0.81 (0.17)	<0.001
<b>Acute Treatment</b>	0.00 (0.01)	0.74	-0.01 (0.01)	0.32
<b>Inpatient Management</b>	0.01 (0.01)	0.25	0.00 (0.01)	0.46
<b>Secondary Prevention</b>	-0.01 (0.01)	0.34	0.00 (0.01)	0.68
<b>SATISFACTION</b>				
<b>Global</b>				
Second quartile	-0.06 (0.1)	0.57	-0.09 (0.07)	0.19
Third quartile	-0.19 (0.13)	0.14	-0.12 (0.08)	0.14
Highest quartile	-0.39 (0.16)	0.02	-0.30 (0.11)	0.006
<b>Environment</b>				
Second quartile	0.09 (0.09)	0.35	0.11 (0.06)	0.07
Third quartile	0.09 (0.11)	0.42	0.20 (0.08)	0.01
Highest quartile	0.04 (0.16)	0.83	0.27 (0.11)	0.01

<b>Communication</b>				
Second quartile	-0.1 (0.11)	0.33	-0.03 (0.07)	0.69
Third quartile	-0.26 (0.14)	0.07	0.04 (0.09)	0.68
Highest quartile	-0.15 (0.21)	0.47	0.23 (0.14)	0.10
<b>Pain control</b>				
Second quartile	-0.24 (0.1)	0.02	-0.01 (0.07)	0.89
Third quartile	-0.29 (0.13)	0.02	-0.08 (0.08)	0.35
Highest quartile	-0.57 (0.18)	0.002	0.03 (0.12)	0.83
<b>Staff responsiveness</b>				
Second quartile	0.09 (0.1)	0.36	-0.12 (0.07)	0.07
Third quartile	0.11 (0.13)	0.36	-0.10 (0.08)	0.22
Highest quartile	0.05 (0.19)	0.77	-0.15 (0.12)	0.23
<b>Care transition</b>				
Second quartile	0.09 (0.11)	0.38	-0.15 (0.07)	0.04
Third quartile	0.07 (0.14)	0.59	-0.11 (0.09)	0.21
Highest quartile	0.39 (0.19)	0.04	-0.21 (0.12)	0.09
<b>Discharge information</b>				
Second quartile	0.49 (0.09)	<0.001	-0.20 (0.06)	0.001
Third quartile	0.74 (0.12)	<0.001	-0.39 (0.08)	<0.001
Highest quartile	0.70 (0.14)	<0.001	-0.37 (0.09)	<0.001

Note: The lowest quartile was taken as reference group. The level of significance for P values is 0.05.

**Table 3.** The Full Regression Results of the Sensitivity Analysis for Patient Satisfaction and Stroke Care Costs

Explanatory variables	DRG 66		All stroke DRGs	
	Beta (SE) N=1800	P value	Beta (SE) N=1800	P value
<b>INTERCEPT</b>	8.81 (0.04)	<0.001	8.92 (0.04)	<0.001
<b>COVARIATES</b>				
<b>Rural</b>	-0.08 (0.02)	<0.001	-0.04 (0.02)	0.05
<b>Teaching</b>	-0.02 (0.01)	0.12	-0.02 (0.02)	0.25
<b>Hospital Ownership</b>				
Non-for Profit	-0.04 (0.02)	0.07	-0.05 (0.02)	0.01
For Profit	-0.11 (0.02)	<0.001	-0.11 (0.02)	<0.001
Other	-0.01 (0.23)	0.96	0.02 (0.16)	0.89
Public	Reference	-	Reference	-
<b>Hospital Size</b>				
Small	0.00 (0.02)	0.91	0.01 (0.02)	0.57
Middle	-0.01 (0.01)	0.41	-0.01 (0.02)	0.42
Large	Reference	-	Reference	-
<b>Regions</b>				
Midwest	-0.14 (0.02)	<0.001	-0.16 (0.02)	<0.001
South	-0.26 (0.02)	<0.001	-0.27 (0.02)	<0.001
West	-0.10 (0.03)	<0.001	-0.15 (0.03)	<0.001
Northwest	Reference	-	Reference	-
<b>Registered Stroke Center</b>	0.05 (0.02)	<0.001	0.07 (0.02)	<0.001
<b>DSH Patient Percent</b>	0.33 (0.05)	<0.001	0.37 (0.05)	<0.001
<b>SATISFACTION</b>				
<b>Global</b>				
Second quartile	0.01 (0.02)	0.66	0.02 (0.02)	0.35
Third quartile	0.00 (0.02)	0.95	0.00 (0.02)	0.87
Highest quartile	0.08 (0.03)	0.01	0.08 (0.03)	0.009
<b>Environment</b>				
Second quartile	0.02 (0.02)	0.22	0.02 (0.02)	0.33
Third quartile	0.05 (0.02)	0.02	0.04 (0.02)	0.05
Highest quartile	0.07 (0.03)	0.04	0.05 (0.03)	0.10
<b>Communication</b>				
Second quartile	0.01 (0.02)	0.66	0.00 (0.02)	0.94
Third quartile	-0.03 (0.03)	0.26	-0.02 (0.03)	0.44

Highest quartile	-0.03 (0.04)	0.43	-0.03 (0.04)	0.49
<b>Pain control</b>				
Second quartile	0.02 (0.02)	0.20	0.01 (0.02)	0.62
Third quartile	0.04 (0.02)	0.11	0.01 (0.02)	0.55
Highest quartile	0.01 (0.04)	0.71	-0.01 (0.04)	0.88
<b>Staff responsiveness</b>				
Second quartile	-0.03 (0.02)	0.14	-0.02 (0.02)	0.30
Third quartile	-0.06 (0.02)	0.006	-0.04 (0.02)	0.11
Highest quartile	0.01 (0.04)	0.73	0.02 (0.04)	0.54
<b>Care transition</b>				
Second quartile	0.01 (0.02)	0.63	0.01 (0.02)	0.48
Third quartile	0.00 (0.03)	0.90	0.03 (0.03)	0.34
Highest quartile	0.01 (0.04)	0.84	0.05 (0.04)	0.20
<b>Discharge information</b>				
Second quartile	-0.03 (0.02)	0.15	-0.03 (0.02)	0.1
Third quartile	-0.04 (0.02)	0.05	-0.06 (0.02)	0.006
Highest quartile	0.00 (0.03)	0.95	-0.02 (0.03)	0.41

Note: The lowest quartile was taken as reference group. The level of significance for P values is 0.05.

**Table 4.** The Association Between Patient Satisfaction and Acute, Inpatient, and Secondary Stroke Care Performance

Satisfaction Measures	Acute Treatment Performance		Inpatient Management Performance		Secondary Prevention Performance	
	Beta (SE) N=2530	<i>P</i>	Beta (SE) N=2530	<i>P</i>	Beta (SE) N=2530	<i>P</i>
<b>Global</b>						
Second quartile	0.04 (0.25)	0.87	0.07 (0.32)	0.84	0.33 (0.35)	0.34
Third quartile	0.14 (0.31)	0.66	0.5 (0.39)	0.2	0.75 (0.43)	0.08
Highest quartile	-0.05 (0.4)	0.89	0.16 (0.5)	0.75	0.15 (0.55)	0.78
<b>Environment</b>						
Second quartile	0.43 (0.22)	0.05	0.35 (0.29)	0.22	0.75 (0.31)	0.01
Third quartile	0.44 (0.28)	0.11	0.44 (0.35)	0.21	0.56 (0.38)	0.14
Highest quartile	-0.23 (0.39)	0.56	0.02 (0.5)	0.97	0.38 (0.55)	0.49
<b>Communication</b>						
Second quartile	-0.01 (0.26)	0.98	0.1 (0.33)	0.77	0.12 (0.36)	0.74
Third quartile	0.06 (0.34)	0.86	-0.07 (0.44)	0.86	-0.09 (0.48)	0.86
Highest quartile	0.88 (0.51)	0.08	0.16 (0.64)	0.8	0.48 (0.7)	0.5
<b>Pain control</b>						
Second quartile	-0.11 (0.24)	0.64	-0.43 (0.3)	0.16	-0.36 (0.33)	0.27
Third quartile	0.03 (0.30)	0.93	-0.26 (0.38)	0.49	0.08 (0.42)	0.85
Highest quartile	0.13 (0.44)	0.78	-0.21 (0.56)	0.71	0.89 (0.61)	0.15
<b>Staff responsiveness</b>						
Second quartile	0.43 (0.24)	0.07	0.7 (0.3)	0.02	0.35 (0.33)	0.28
Third quartile	0.11 (0.30)	0.72	0.45 (0.38)	0.24	-0.06 (0.42)	0.89
Highest quartile	-0.59 (0.45)	0.19	0.13 (0.57)	0.82	-0.51 (0.62)	0.41
<b>Care transition</b>						
Second quartile	0.03 (0.26)	0.91	-0.31 (0.33)	0.35	-0.03 (0.36)	0.92
Third quartile	0.07 (0.33)	0.83	-0.14 (0.42)	0.75	0.02 (0.46)	0.97
Highest quartile	0.35 (0.45)	0.44	0.41 (0.57)	0.47	0.28 (0.62)	0.65
<b>Discharge information</b>						
Second quartile	0.12 (0.22)	0.58	0.98 (0.29)	0.001	1.11 (0.31)	<0.001
Third quartile	0.39 (0.28)	0.15	1.35 (0.35)	<0.001	1.46 (0.38)	<0.001
Highest quartile	0.44 (0.34)	0.20	1.67 (0.43)	<0.001	1.82 (0.47)	<0.001

SE indicates standard error.

Note: The lowest quartile was taken as reference group and all models were adjusted for hospital level covariates. The level of significance for *P* values is 0.05.

**Table 5.** The Full Regression Results Between Patient Satisfaction and Acute, Inpatient, and Secondary Stroke Care Performance

Explanatory Variables	Acute treatment performance		Inpatient management performance		Secondary prevention performance	
	Beta (SE) N=2530	P value	Beta (SE) N=2530	P value	Beta (SE) N=2530	P value
<b>INTERCEPT</b>	97.75 (0.47)	<0.001	93.92 (0.6)	<0.001	91.92 (0.66)	<0.001
<b>COVARIATES</b>						
<b>Rural</b>	-0.52 (0.27)	0.05	-1.38 (0.34)	<0.001	-2.06 (0.37)	<0.001
<b>Teaching</b>	0.29 (0.20)	0.15	0.94 (0.25)	<0.001	0.54 (0.27)	0.05
<b>Hospital Ownership</b>						
Non-for Profit	0.83 (0.24)	0.001	0.93 (0.31)	0.003	0.85 (0.33)	0.01
For Profit	1.26 (0.29)	<0.001	1.98 (0.37)	<0.001	2.60 (0.40)	<0.001
Other	2.33 (1.63)	0.15	2.15 (1.94)	0.27	3.21 (2.47)	0.19
Public						
<b>Hospital Size</b>						
Small	-0.81 (0.24)	0.001	-1.36 (0.31)	<0.001	-1.21 (0.34)	<0.001
Middle	-0.27 (0.19)	0.16	-0.70 (0.25)	0.005	-0.77 (0.27)	0.004
Large						
<b>Regions</b>						
Midwest	-1.00 (0.27)	<0.001	-0.05 (0.34)	0.89	-0.42 (0.37)	0.26
South	-0.63 (0.27)	0.02	-0.13 (0.34)	0.72	-0.21 (0.37)	0.57
West	-0.27 (0.29)	0.35	0.10 (0.36)	0.79	-0.18 (0.40)	0.65
Northwest						
<b>Registered Stroke Center</b>	0.42 (0.19)	0.03	1.78 (0.24)	<0.001	2.95 (0.26)	<0.001
<b>DSH Patient Percent</b>	-1.81 (0.61)	0.003	-0.55 (0.78)	0.48	-0.75 (0.85)	0.37
<b>Global</b>						
Second quartile	0.04 (0.25)	0.87	0.07 (0.32)	0.84	0.33 (0.35)	0.34
Third quartile	0.14 (0.31)	0.66	0.5 (0.39)	0.2	0.75 (0.43)	0.08

Highest quartile	-0.05 (0.4)	0.89	0.16 (0.5)	0.75	0.15 (0.55)	0.78
<b>Environment</b>						
Second quartile	0.43 (0.22)	0.05	0.35 (0.29)	0.22	0.75 (0.31)	0.01
Third quartile	0.44 (0.28)	0.11	0.44 (0.35)	0.21	0.56 (0.38)	0.14
Highest quartile	-0.23 (0.39)	0.56	0.02 (0.5)	0.97	0.38 (0.55)	0.49
<b>Communication</b>						
Second quartile	-0.01 (0.26)	0.98	0.1 (0.33)	0.77	0.12 (0.36)	0.74
Third quartile	0.06 (0.34)	0.86	-0.07 (0.44)	0.86	-0.09 (0.48)	0.86
Highest quartile	0.88 (0.51)	0.08	0.16 (0.64)	0.8	0.48 (0.7)	0.5
<b>Pain control</b>						
Second quartile	-0.11 (0.24)	0.64	-0.43 (0.3)	0.16	-0.36 (0.33)	0.27
Third quartile	0.03 (0.30)	0.93	-0.26 (0.38)	0.49	0.08 (0.42)	0.85
Highest quartile	0.13 (0.44)	0.78	-0.21 (0.56)	0.71	0.89 (0.61)	0.15
<b>Staff responsiveness</b>						
Second quartile	0.43 (0.24)	0.07	0.7 (0.3)	0.02	0.35 (0.33)	0.28
Third quartile	0.11 (0.30)	0.72	0.45 (0.38)	0.24	-0.06 (0.42)	0.89
Highest quartile	-0.59 (0.45)	0.19	0.13 (0.57)	0.82	-0.51 (0.62)	0.41
<b>Care transition</b>						
Second quartile	0.03 (0.26)	0.91	-0.31 (0.33)	0.35	-0.03 (0.36)	0.92
Third quartile	0.07 (0.33)	0.83	-0.14 (0.42)	0.75	0.02 (0.46)	0.97
Highest quartile	0.35 (0.45)	0.44	0.41 (0.57)	0.47	0.28 (0.62)	0.65
<b>Discharge information</b>						
Second quartile	0.12 (0.22)	0.58	0.98 (0.29)	0.001	1.11 (0.31)	<0.001
Third quartile	0.39 (0.28)	0.15	1.35 (0.35)	<0.001	1.46 (0.38)	<0.001
Highest quartile	0.44 (0.34)	0.20	1.67 (0.43)	<0.001	1.82 (0.47)	<0.001

Note: The lowest quartile was taken as reference group. The level of significance for P values is 0.05.