

Supplementary Materials

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Figure S1 Preoperative Characteristics of Inpatients undergoing Cardiac Surgery before and during pandemic and RHVMC period based on ITS analyses

Figure S2 Clinical Outcomes of Inpatients Who Underwent Cardiac Surgery before and during pandemic and RHVMC period based on ITS analyses adjusted for age, sex and Elixhauser score

Table S1 Cardiac Surgery Identification according to the Society of Thoracic Surgeons

Cardiac Surgery	ICD9-CM3
CABG	36.14
	36.11
	36.13
	36.12
	36.16
	36.10
	36.19
	36.15
AVR	35.21
	35.22
MVR	35.24
	35.23
	35.12

CABG:Coronary Artery Bypass Graft Surgery; AVR: Aortic Valve Replacement; MVR:Mitral Valve Replacement/Repair

Table S2 The Complications based on ICD10 Codes

Complication Categories	Complications	ICD10 Codes
Arrhythmia	Atrial Fibrillation	I48.0
		I48.1
		I48.2
		I48.9
	Other Arrhythmia	I49
	Paroxysmal Ventricular Tachycardia	I47.0
		I47.2
	Atrial Flutter	I48.3
		I48.4
	Atrioventricular Block	I44
Acute Renal Injury	Acute Renal Injury	N17.0
		N17.1
		N17.2
		N17.8
		N17.9
Acute Respiratory Failure	Acute Respiratory Failure	J96.0
		J96.9
		R09.2
Cardiac Complications	Cardiac Complications	I97.1
		I97.7
		I97.8
	Cardiac Arrest	I46
	Acute Pericarditis	I30
Shock	Shock	R57
		T81.1
		R65.2
Pneumonia	Pneumonia	A37.0
		A37.1
		A37.8
		A37.9
		A48.1
		J12
		J13
		J14
		J15
		J16
		J17
		J18
		J69.0
		B96.1

Complication Categories	Complications	ICD10 Codes
		B44.0
Complications Following Procedures	Intraoperative or Postoperative Hemorrhage or Hematoma Complicating a Procedure	E89 G97 H59 H95 I97 J95 K91 T81.0 T81.2 T81.3 T81.4 T81.5 T81.6 T81.7 T81.8 T81.9 T83 M96 N99 T82 T80 T88 G03.8
Sepsis	Sepsis	A22.7 A26.7 A40 A41 A42.7 B37.7
Cerebral Infraction/Intracerebral Hemorrhag	Cerebral Infraction/Intracerebral Hemorrhag	I63 I61
Drug Induced Delirium	Drug Induced Delirium	F11.1 F11.2 F11.9 F12.1 F12.2 F12.9 F13.1 F13.2 F13.9

Complication Categories	Complications	ICD10 Codes
		F14.1 F14.2 F14.9 F15.1 F15.2 F15.9 F16.1 F16.2 F16.9 F18.1 F18.2 F18.9 F19.1 F19.2 F19.9
Pulmonary Embolism	Pulmonary Embolism	I26.0 I26.9
Others	Defibrination Syndrome/Disseminated intravascular coagulation	D65
	Intestinal Infection due to Clostridium Difficile	A04.7
	Venous Thromboembolism	I82
	Anoxic Brain Damage	G93.1
	Bacteremia	R78.8
	Bacterial infection due to Other Organisms	B96.8
	Injury of Bladder or Urethra	S37.2 S37.3
	Pressure Ulcer	L89

Table S3 Association of Pandemic and RHVMC Period with Outcomes in Patients Undergoing Cardiac Surgery in PSM analyses

Outcomes	Model1				Model2				Model3		
	Effect Size ^a	95%CI	P		Effect Size ^a	95%CI	P		Effect Size ^a	95%CI	P
Inflated Adjusted Costs	0.95	0.93-0.97	P<0.0001	.	0.96	0.94-0.98	P<0.0001	.	0.97	0.95-0.99	0.0037
LOS	0.95	0.93-0.97	P<0.0001	.	0.96	0.94-0.98	P<0.0001	.	0.96	0.94-0.98	P<0.0001
In-hospital Mortality	1.00	0.57-1.74	1.0000		1.04	0.60-1.80	0.8891		1.24	0.73-2.11	0.4238
In-hospital Complications	1.05	0.86-1.29	0.6106	.	1.12	0.92-1.36	0.2673	.	1.05	0.86-1.28	0.6456
30 day Readmissions	1.11	0.01-207.87	0.9577	.	1.25	0.01-232.93	0.9131	.	1.14	0.01-213.10	0.9478

^aFor costs and LOS, effect size were expressed as relative ratio estimated by log linear regressions; For in-hospital mortality, in-hospital complications and 30-day readmissions, effect size were expressed as odds ratio (OR) estimated by firth logistic regressions.

Table S4 The Effect of Pandemic RHVMC Period on Costs of Consumables and Drugs among Patients Undergoing Cardiac Surgery in Multivariate Analyses

Outcomes	Model1				Model2				Model3		
	Effect Size ^a	95%CI	P		Effect Size ^a	95%CI	P		Effect Size ^a	95%CI	P
Inflated Adjusted Consumable Costs	0.90	0.89-0.92	P<0.0001	.	0.91	0.89-0.92	P<0.0001	.	0.93	0.91-0.95	P<0.0001
Inflated Adjusted Drug Costs	0.84	0.82-0.86	P<0.0001	.	0.84	0.82-0.86	P<0.0001	.	0.86	0.83-0.88	P<0.0001
Proportion of Drug Costs	0.95	0.94-0.96	P<0.0001	.	0.95	0.94-0.96	P<0.0001	.	0.96	0.95-0.97	P<0.0001
Proportion of Consumable Costs	0.88	0.87-0.90	P<0.0001	.	0.89	0.87-0.90	P<0.0001	.	0.88	0.87-0.90	P<0.0001

^aEffect size were expressed as relative ratio estimated by multivariate log linear regressions.

Table S5 The Effect of Pandemic RHVMC Period on Costs of Consumables and Drugs among Patients Undergoing Cardiac Surgery in PSM Analyses

Outcomes		Model1				Model2				Model3		
		Effect Size ^a	95%CI	P		Effect Size ^a	95%CI	P		Effect Size ^a	95%CI	P
Inflated Adjusted Consumable	Costs	0.90	0.88-0.92	P<0.0001	.	0.90	0.88-0.92	P<0.0001	.	0.92	0.90-0.94	P<0.0001
Inflated Adjusted Drug Costs		0.85	0.82-0.87	P<0.0001	.	0.84	0.82-0.87	P<0.0001	.	0.84	0.82-0.87	P<0.0001
Proportion of Drug Costs		0.95	0.94-0.96	P<0.0001	.	0.95	0.94-0.97	P<0.0001	.	0.96	0.94-0.97	P<0.0001
Proportion of Consumable Costs		0.89	0.87-0.91	P<0.0001	.	0.89	0.87-0.90	P<0.0001	.	0.88	0.86-0.90	P<0.0001

^aEffect size were expressed as relative ratio estimated by multivariate log linear regressions.



