

Supplemental Information

SUPPLEMENTAL TABLE 6 Baseline Characteristics and Outcomes for Children Undergoing Congenital Heart Surgery, by RACHS-1 Category

	Entire Cohort (N = 101 013)	RACHS-1 Category 1 (n = 11 947)	RACHS-1 Category 2 (n = 35 024)	RACHS-1 Category 3 (n = 38 014)	RACHS-1 Category 4 (n = 12 560)	RACHS-1 Category 5 and 6 (n = 3468)	P
Patient age							<.01*
<30 d	24 987 (24.7)	245 (2.1)	5762 (16.5)	9119 (24.0)	6601 (52.6)	3260 (94.0)	—
30 d–1 y	34 900 (34.6)	3666 (30.7)	16 883 (48.2)	10 999 (28.9)	3206 (25.5)	146 (4.2)	—
1–4 y	21 818 (21.6)	4314 (36.1)	5696 (16.3)	10 117 (26.6)	1641 (13.1)	50 (1.4)	—
5–12 y	12 200 (12.1)	2661 (22.3)	4007 (11.4)	4737 (12.5)	785 (6.3)	10 (0.3)	—
≥13 y	7 108 (7.0)	1061 (8.9)	2676 (7.6)	3042 (8.0)	327 (2.6)	2 (0.1)	—
Sex, male	55 878 (55.3)	5747 (48.1)	19 711 (56.3)	21 007 (55.3)	7327 (58.3)	2086 (60.2)	<.01*
Race and/or ethnicity							<.01*
White, non-Hispanic	53 602 (53.1)	6260 (52.4)	18 326 (52.3)	20 681 (54.4)	6515 (51.9)	1820 (52.5)	—
Black, non-Hispanic	12 300 (12.2)	1520 (12.7)	4285 (12.2)	4648 (12.2)	1466 (11.7)	381 (11.0)	—
Hispanic or Latino	18 557 (18.4)	2133 (17.9)	6466 (18.5)	6807 (17.9)	16 807 (19.4)	715 (20.6)	—
Asian	3305 (3.3)	368 (3.1)	1342 (3.8)	1157 (3.0)	358 (2.9)	80 (2.3)	—
Other	13 249 (13.1)	1666 (13.9)	4605 (13.2)	4721 (12.4)	1785 (14.2)	472 (13.6)	—
Payer							
Public	45 501 (45.0)	5120 (42.9)	15 719 (44.9)	17 050 (44.9)	5941 (47.3)	1671 (48.2)	<.01*
Private, commercial, or employer-based	40 810 (40.4)	5054 (42.3)	14 047 (40.1)	15 547 (40.9)	4895 (39.0)	1267 (36.5)	—
Uninsured	1857 (1.8)	205 (1.7)	673 (1.9)	701 (1.8)	227 (1.8)	51 (1.5)	—
Other or missing	12 845 (12.7)	1568 (13.1)	4585 (13.1)	4716 (12.4)	1497 (11.9)	479 (13.8)	—
Urban	84 200 (83.4)	9934 (83.2)	29 334 (83.8)	31 589 (83.1)	10 444 (83.2)	2899 (83.6)	.14
Prematurity	4335 (4.3)	744 (6.2)	971 (2.8)	1269 (3.3)	948 (7.6)	403 (11.6)	<.01*
Other complex chronic condition	37 386 (37.0)	3009 (25.2)	11 312 (32.3)	15 910 (41.9)	5461 (43.5)	1694 (48.9)	<.01*
Mortality	1933 (2.9)	91 (0.8)	397 (1.1)	1145 (3.0)	811 (6.5)	489 (14.1)	<.01*
Length of stay, d	8 (4–18)	4 (3–6)	6 (4–11)	10 (5–20)	15 (7–31)	32 (20–52)	<.01*
% length of stay <72 h	14 523 (14.4)	5124 (42.9)	5334 (15.2)	2662 (7.0)	1378 (11.0)	25 (0.7)	<.01*
Total standardized costs, US 2015 \$, thousands	55 (34–108)	28 (21–44)	45 (32–75)	65 (41–120)	92 (45–177)	178 (118–285)	<.01*
% total costs <=\$30 000	19 693 (19.5)	6410 (53.7)	7390 (21.1)	3899 (10.3)	1975 (15.7)	19 (0.6)	<.01*

Data presented as mean or median (SD or IQR) for continuous variables and n (%) for categorical variables. —, not applicable.

* P < .05.

SUPPLEMENTAL TABLE 7 Multivariable Models for Mortality, Length of Stay, Costs, and Costs per Day for Children Undergoing Congenital Heart Surgery

Parameter	Mortality		Length of Stay		Costs		Costs per Day	
	OR (95% CI)	P	% Change (95% CI)	P	% Change (95% CI)	P	% Change (95% CI)	P
Median household income								
Quartile 1	1.18 (1.03 to 1.35)	.02*	7.3 (1.0 to 14.0)	.02*	7.1 (0.8 to 13.7)	.03*	0.2 (−3.9 to 4.6)	.91
Quartile 2	1.13 (1.00 to 1.29)	.06	4.3 (0.4 to 8.4)	.030*	6.7 (1.0 to 12.7)	.02*	2.5 (1.8 to 7.0)	.26
Quartile 3	1.11 (0.98 to 1.26)	.11	1.6 (−0.6 to 3.9)	.16	3.4 (−0.3 to 7.2)	.07	2.0 (−1.1 to 5.1)	.21
Quartile 4	Reference	—	Reference	—	Reference	—	Reference	—
Patient age								
<30 d	3.81 (2.93 to 4.97)	<.01*	260.0 (238.6 to 282.9)	<.01*	97.4 (80.7 to 115.8)	<.01*	−44.1 (−39.2 to −48.5)	<.01*
30 d–1 y	1.25 (0.96 to 1.63)	.10	52.3 (45.4 to 59.6)	<.01*	0.8 (−4.5 to 6.4)	.78	−34.1 (−29.7 to −38.1)	<.01*
1–4 y	0.72 (0.54 to 0.97)	.03*	10.1 (6.3 to 14.1)	<.01*	−16.4 (−12.8 to −19.9)	<.01*	−24.4 (−20.9 to −27.8)	<.01*
5–12 y	0.74 (0.53 to 1.03)	.07	−5.1 (−2.4 to −7.6)	<.01*	−14.3 (−11.7 to −16.8)	<.01*	−9.9 (−7.8 to −12.0)	<.01*
≥13 y	Reference	—	Reference	—	Reference	—	Reference	—
Sex, male	0.89 (0.82 to 0.97)	<.01*	1.4 (0.6 to 2.2)	.01*	1.7 (0.8 to 2.6)	<.01*	0.1 (−0.4 to 0.7)	.60
Race and/or ethnicity								
White, non-Hispanic	Reference	—	Reference	—	Reference	—	Reference	—
Asian	1.15 (0.88 to 1.51)	.30	11.6 (7.9 to 15.4)	<.01*	9.5 (2.8 to 16.7)	<.01*	−1.7 (−7.0 to 3.9)	.55
Black, non-Hispanic	1.23 (1.08 to 1.42)	<.01*	7.5 (2.1 to 13.1)	<.01*	0.6 (−5.5 to 7.0)	.86	−6.2 (−11.1 to −1.0)	.02*
Hispanic or Latino	1.08 (0.95 to 1.23)	.23	4.9 (−0.9 to 10.9)	.10	2.7 (−3.3 to 9.1)	.38	−2.0 (−9.2 to 5.8)	.61
Other	1.70 (1.51 to 1.92)	<.01*	4.6 (0.1 to 9.3)	.04*	−0.1 (−5.9 to 6.0)	.97	−3.6 (−8.6 to 1.7)	.18
Public payer	1.15 (1.05 to 1.26)	<.01*	11.0 (7.1 to 15.0)	<.01*	8.8 (5.1 to 12.7)	<.01*	−1.8 (−6.2 to 2.8)	.45
Region								
Midwest	1.13 (0.89 to 1.42)	.31	2.0 (−8.5 to 13.7)	.72	−11.2 (−25.7 to 6.2)	.20	−12.9 (−27.5 to 4.6)	.14
Northeast	0.86 (0.65 to 1.15)	.30	−1.7 (−12.3 to 10.2)	.77	−30.5 (−43.6 to −14.2)	<.01*	−29.5 (−42.7 to −13.2)	<.01*
South	1.09 (0.88 to 1.35)	.44	8.7 (−8.1 to 28.6)	.33	−8.1 (−26.6 to 15.0)	.46	−15.5 (−32.0 to 5.0)	.13
West	Reference	—	Reference	—	Reference	—	Reference	NA
Urban	0.99 (0.88 to 1.12)	.90	−0.6 (−3.4 to 2.2)	.66	3.9 (−2.8 to 10.9)	.26	4.6 (−1.8 to 11.5)	.16
RACHS-1 score								
1	Reference	—	Reference	—	Reference	—	Reference	—
2	0.97 (0.76 to 1.23)	.78	18.9 (13.8 to 24.2)	<.01*	30.6 (22.5 to 39.3)	<.01*	9.9 (6.2 to 13.7)	<.01*
3	2.36 (1.87 to 2.98)	<.01*	67.3 (60.2 to 66.2)	<.01*	74.5 (63.3 to 86.5)	<.01*	5.0 (1.5 to 8.6)	<.01*
4	3.36 (2.62 to 4.3)	<.01*	56.6 (47.6 to 66.2)	<.01*	63.6 (50.8 to 77.5)	<.01*	6.5 (2.9 to 10.3)	<.01*
5 or 6	5.80 (4.41 to 7.64)	<.01*	126.6 (110.1 to 144.4)	<.01*	155.5 (132.5 to 180.8)	<.01*	19.7 (14.0 to 25.7)	<.01*
Prematurity	3.23 (2.82 to 3.70)	<.01*	98.1 (83.8 to 113.6)	<.01*	78.4 (65.7 to 92.2)	<.01*	−4.6 (−1.2 to −7.9)	<.01*
Other complex chronic condition	3.63 (3.26 to 4.04)	<.01*	66.0 (64.4 to 71.7)	<.01*	57.2 (51.9 to 62.7)	<.01*	−5.0 (−2.5 to −7.3)	<.01*

All models cluster SE by center. Mortality model also clusters SE by patient. Models including state instead of region yielded nearly identical results. —, not applicable.

* $P < .05$.

SUPPLEMENTAL TABLE 8 Baseline Characteristics for all PHIS Discharges by Median Neighborhood Annual HHI-Q, 2012–2015

	Entire Cohort (N = 1175367)	HHI-Q1: Median Annual Household Income ≤\$32766 (n = 293656)	HHI-Q2: Median Annual Household Income \$32766–41412 (n = 294016)	HHI-Q3: Median Annual Household Income \$41412–54410 (n = 293676)	HHI-Q4: Median Annual Household Income >\$54410 (n = 294019)	P
Patient age						<.01*
<30 d	183469 (15.6)	45787 (15.6)	46136 (15.7)	45306 (15.4)	46240 (15.7)	—
30 d–1 y	164666 (14.0)	46128 (15.7)	43900 (14.9)	41237 (14.0)	33401 (11.4)	—
1–4 y	240896 (20.5)	63715 (21.7)	62059 (21.1)	60773 (20.7)	54349 (18.5)	—
5–12 y	278324 (23.7)	67414 (23.0)	69744 (23.7)	70162 (23.9)	71004 (24.2)	—
≥13 y	308012 (26.2)	70612 (24.1)	72177 (24.6)	76198 (26.0)	89025 (30.3)	—
Sex, male	603260 (51.3)	151717 (51.7)	153167 (52.1)	151432 (51.6)	146944 (50.0)	<.01*
Race and/or ethnicity						<.01*
White, non-Hispanic	564499 (48.0)	101796 (34.7)	139350 (47.4)	151316 (51.5)	172056 (58.5)	—
Black, non-Hispanic	206398 (17.6)	83120 (28.3)	52400 (17.8)	42439 (14.5)	28439 (9.7)	—
Hispanic or Latino	243620 (20.7)	70642 (24.1)	67886 (23.1)	63402 (21.6)	41690 (14.2)	—
Asian	40003 (3.4)	5272 (1.8)	6939 (2.4)	8813 (3.0)	8979 (6.5)	—
Other	120848 (10.3)	32826 (11.2)	27461 (9.3)	27706 (9.4)	32855 (11.2)	—
Payer						<.01*
Public	613354 (52.2)	211557 (72.0)	178072 (60.6)	145285 (49.5)	78440 (26.7)	—
Private, commercial, or employer-based	476067 (40.5)	60879 (20.7)	93063 (31.7)	126255 (43.0)	195870 (66.6)	—
Uninsured	18610 (1.6)	4793 (1.6)	5020 (1.7)	4642 (1.6)	4155 (1.4)	—
Other or missing	67336 (5.7)	16427 (5.6)	17861 (6.1)	17494 (6.0)	15554 (5.3)	—
Urban	1036362 (88.2)	228891 (78.0)	241129 (82.0)	274123 (93.3)	292219 (99.4)	<.01*
Prematurity	30860 (2.6)	8830 (3.0)	8240 (2.8)	7638 (2.6)	6152 (2.1)	<.01*
Other complex chronic condition	509986 (43.4)	121669 (41.4)	129293 (44.0)	130697 (44.5)	128327 (43.7)	<.01*
Mortality	9194 (0.8)	2581 (0.9)	2444 (0.8)	2302 (0.8)	1867 (0.6)	<.01*
Length of stay, d	3 (2–5)	3 (2–5)	3 (2–5)	3 (2–5)	3 (2–5)	<.01*
% length of stay <72 h	632712 (53.8)	157652 (53.7)	156550 (53.3)	157348 (53.6)	161162 (54.8)	<.01*
Total standardized costs, US 2015 \$	8549 (4540–18392)	8027 (4353–17324)	8640 (4533–18863)	8736 (4632–18635)	8814 (4656–18485)	<.01*
% total costs <\$30000	992298 (84.4)	248692 (84.7)	246323 (83.8)	246984 (84.1)	250299 (85.1)	<.001*

Data presented as mean or median (SD or IQR) for continuous variables and n (%) for categorical variables. HHI-Q, household income quartile; HHI-Q1, household income quartile 1; HHI-Q2, household income quartile 2; HHI-Q3, household income quartile 3; HHI-Q4, household income quartile 4. —, not applicable.

* P < .05.