

Supplementary Material to: Koh JJE, Tan YZ, Oh HC, et al. Factors associated with persistent high healthcare service utilisers in eastern Singapore in 2020–2022: A population health analysis. Ann Acad Med Singap 2025;54. DOI: <https://doi.org/10.47102/annals-acadmedsg.202543>

Table S5. Subgroup analysis: PHUs versus non-PHUs by sex (female and male), age group (above 60 and 60 and below) and ethnicity (Chinese, Malay, Indian and Others).

	Female			Male			Above 60 years			Age 60 and below years		
	PHUs	Non-PHUs	Pvalue	PHUs	Non-PHUs	Pvalue	PHUs	Non-PHUs	Pvalue	PHUs	Non-PHUs	Pvalue
	(n=2256)	(n=116,253)		(n=3060)	(n=146,269)		(n=3648)	(n=84,827)		(n=1668)	(n=177,695)	
Total gross bill from 2020 to 2022												
Mean (SD)	53,900 (57,300)	4910 (11,400)	<0.001	57,900 (52,200)	5290 (12,200)	<0.001	56,100 (46,000)	8940 (15,700)	<0.001	56,300 (69,500)	3280 (8930)	<0.001
Median [Q1, Q3]	41,100 [26,000, 65,600]	1340 [425, 4670]		41,200 [25,800, 70,500]	1380 [434, 4950]		42,300 [26,800, 69,500]	3750 [882, 10,400]		38,700 [24,300, 63,800]	928 [368, 2880]	
Inpatient admissions, no. (%)	2022 (90)	28,851 (25)	<0.001	2715 (89)	38,343 (26)	<0.001	3343 (92)	33,463 (39)	<0.001	1394 (84)	33,731 (19)	<0.001
Total inpatient gross bill from 2020 to 2022												
Mean (SD)	41,300 (58,300)	11,600 (18,600)	<0.001	45,700 (51,900)	12,300 (19,600)	<0.001	43,500 (45,200)	14,700 (20,300)	<0.001	44,500 (72,700)	9130 (17,500)	<0.001
Median [Q1, Q3]	29,400 [14,100, 52,600]	6000 [2690, 14,400]		29,800 [13,400, 59,000]	6170 [2720, 14,700]		30,600 [14,400, 57,000]	8240 [3590, 18,200]		27,300 [12,000, 51,200]	4400 [2170, 10,400]	
Total no. of inpatient admissions from 2020 to 2022												
Mean (SD)	5.13 (4.85)	1.49 (1.09)	<0.001	5.51 (5.30)	1.55 (1.35)	<0.001	5.08 (4.45)	1.66 (1.26)	<0.001	5.98 (6.40)	1.40 (1.22)	<0.001
Median [Q1, Q3]	4.00 [2.00, 6.00]	1.00 [1.00, 2.00]		4.00 [2.00, 7.00]	1.00 [1.00, 2.00]		4.00 [2.00, 6.00]	1.00 [1.00, 2.00]		4.00 [2.00, 7.00]	1.00 [1.00, 1.00]	
Total no. of inpatient LOS from 2020 to 2022												
Mean (SD)	34.1 (36.8)	8.90 (17.5)	<0.001	34.4 (41.9)	8.18 (15.5)	<0.001	36.7 (40.4)	11.6 (20.1)	<0.001	28.3 (37.6)	5.17 (10.2)	<0.001
Median [Q1, Q3]	23.0 [10.0, 45.0]	4.00 [2.00, 9.00]		20.0 [8.00, 45.0]	3.00 [2.00, 8.00]		24.0 [10.0, 49.0]	5.00 [3.00, 13.0]		16.0 [6.00, 35.0]	3.00 [1.00, 5.00]	
ED visits, no. (%)	2059 (91)	67,625 (58)	<0.001	2723 (89)	87,329 (60)	<0.001	3358 (92)	51,301 (60)	<0.001	1424 (85)	103,653 (58)	<0.001
Total ED gross bill from 2020 to 2022												
Mean (SD)	3080 (4720)	781 (994)	<0.001	3240 (4480)	786 (987)	<0.001	3010 (3030)	933 (1150)	<0.001	3530 (6990)	710 (891)	<0.001
Median [Q1, Q3]	2190 [1190, 3760]	528 [355, 878]		2170 [1120, 3860]	521 [346, 873]		2230 [1210, 3810]	609 [433, 1080]		2060 [1000, 3880]	480 [324, 772]	
Total no. of ED visits from 2020 to 2022												
Mean (SD)	5.84 (12.9)	1.59 (1.32)	<0.001	6.48 (11.8)	1.70 (2.00)	<0.001	5.62 (5.32)	1.76 (1.49)	<0.001	7.58 (20.9)	1.60 (1.85)	<0.001
Median [Q1, Q3]	4.00 [2.00, 7.00]	1.00 [1.00, 2.00]		4.00 [2.00, 7.00]	1.00 [1.00, 2.00]		4.00 [2.00, 7.00]	1.00 [1.00, 2.00]		4.00 [2.00, 8.00]	1.00 [1.00, 2.00]	
Outpatient admissions, no. (%)	2245 (100)	92,920 (80)	<0.001	3050 (100)	115,927 (79)	<0.001	3634 (100)	74,443 (88)	<0.001	1661 (100)	134,404 (76)	<0.001
Total outpatient gross bill from 2020 to 2022												
Mean (SD)	11,800 (9550)	1530 (2120)	<0.001	11,900 (8300)	1630 (2270)	<0.001	11,100 (7930)	2190 (2590)	<0.001	13,500 (10,400)	1240 (1860)	<0.001
Median [Q1, Q3]	10,600 [5900, 14,900]	731 [241, 1890]		11,000 [6140, 15,800]	785 [262, 1990]		10,300 [5780, 14,700]	1220 [377, 3070]		12,000 [6900, 17,200]	570 [220, 1470]	
Total outpatient admissions from 2020 to 2022												
Mean (SD)	60.8 (43.1)	9.91 (12.8)	<0.001	59.9 (42.7)	9.45 (12.2)	<0.001	59.3 (40.9)	13.4 (15.0)	<0.001	62.4 (46.7)	7.59 (10.2)	<0.001
Median [Q1, Q3]	52.0 [33.0, 78.0]	5.00 [2.00, 13.0]		50.0 [32.0, 76.0]	5.00 [2.00, 12.0]		51.0 [32.0, 76.0]	8.00 [3.00, 18.0]		52.0 [33.0, 79.0]	4.00 [2.00, 9.00]	
Patients who had day surgery, no. (%)	1232 (55)	24,020 (21)	<0.001	1830 (60)	29,841 (20)	<0.001	2072 (57)	24337 (29)	<0.001	990 (59)	29,524 (17)	<0.001

Patients who had day surgery (DS1 data)												
Mean (SD)	2.47 (1.86)	1.53 (0.964)	<0.001	2.66 (2.03)	1.57 (1.04)	<0.001	2.53 (1.97)	1.64 (1.10)	<0.001	2.69 (1.96)	1.48 (0.913)	<0.001
Median [Q1, Q3]	2.00 [1.00, 3.00]	1.00 [1.00, 2.00]		2.00 [1.00, 3.00]	1.00 [1.00, 2.00]		2.00 [1.00, 3.00]	1.00 [1.00, 2.00]		2.00 [1.00, 4.00]	1.00 [1.00, 2.00]	
Total day surgery gross bill from 2020 to 2022												
Mean (SD)	5340 (5310)	2990 (3230)	<0.001	5270 (4620)	2910 (2960)	<0.001	5210 (4720)	3440 (3150)	<0.001	5500 (5280)	2540 (2970)	<0.001
Median [Q1, Q3]	3710 [1770, 7380]	2050 [923, 3670]		3820 [1940, 7570]	2110 [906, 3700]		3780 [1910, 7420]	2620 [1310, 4140]		3740 [1790, 7700]	1660 [745, 3010]	

	Chinese			Malay			Indian			Other races		
	PHUs	Non-PHUs	<i>P</i> value	PHUs	Non-PHUs	<i>P</i> value	PHUs	Non-PHUs	<i>P</i> value	PHUs	Non-PHU	<i>P</i> value
	(n=3232)	(n=174,195)		(n=1055)	(n=47,478)		(n=482)	(n=21,313)		(n=547)	(n=19,536)	
Total gross bill from 2020 to 2022												
Mean (SD)	52,700 (53,900)	5160 (11,900)	<0.001	64,000 (55,000)	5120 (11,500)	<0.001	56,400 (51,700)	4650 (12,500)	<0.001	61,400 (57,500)	5250 (11,400)	<0.001
Median [Q1, Q3]	39,300 [24,800, 65,300]	1430 [435, 4890]		47,500 [29,000, 77,700]	1200 [416, 4730]		40,000 [26,400, 63,900]	1180 [410, 4330]		43,100 [28,100, 73,300]	1410 [451, 5010]	
Inpatient admissions, no. (%)	2800 (87)	42,786 (25)	<0.001	997 (95)	13,178 (28)	<0.001	442 (92)	5519 (26)	<0.001	498 (91)	5711 (29)	<0.001
Total Inpatient gross bill from 2020 to 2022												
Mean (SD)	41,300 (55,500)	12,400 (19,700)	<0.001	49,600 (53,400)	11,700 (17,400)	<0.001	42,100 (49,400)	10,800 (21,700)	<0.001	47,800 (56,900)	11,200 (17,100)	<0.001
Median [Q1, Q3]	28,700 [13,000, 53,400]	6400 [2780, 15,100]		34,100 [15,900, 62,000]	5870 [2680, 14,000]		26,400 [11,700, 49,900]	5230 [2540, 12,600]		29,900 [14,800, 60,400]	5460 [2530, 13,500]	
Total no. of inpatient admissions from 2020 to 2022												
Mean (SD)	4.92 (4.83)	1.50 (1.15)	<0.001	6.00 (5.48)	1.58 (1.46)	<0.001	5.81 (5.34)	1.58 (1.46)	<0.001	5.99 (5.48)	1.55 (1.16)	<0.001
Median [Q1, Q3]	4.00 [2.00, 6.00]	1.00 [1.00, 2.00]		4.00 [3.00, 7.00]	1.00 [1.00, 2.00]		4.00 [2.00, 7.00]	1.00 [1.00, 2.00]		4.00 [3.00, 8.00]	1.00 [1.00, 2.00]	
Total no. of inpatient LOS from 2020 to 2022												
Mean (SD)	33.5 (38.1)	8.99 (17.6)	<0.001	36.1 (39.9)	7.82 (13.7)	<0.001	31.6 (38.3)	7.22 (14.9)	<0.001	37.1 (49.0)	7.52 (13.0)	<0.001
Median [Q1, Q3]	21.0 [8.00, 45.0]	4.00 [2.00, 9.00]		22.0 [10.0, 48.0]	4.00 [2.00, 8.00]		18.0 [7.00, 39.5]	3.00 [2.00, 7.00]		22.0 [10.0, 45.0]	3.00 [2.00, 8.00]	
ED visits, no. (%)	2829 (88)	95,532 (55)	<0.001	1003 (95)	32,517 (68)	<0.001	442 (92)	13,581 (64)	<0.001	508 (93)	13,324 (68)	<0.001
Total ED gross bill from 2020 to 2022												
Mean (SD)	2840 (3130)	755 (1000)	<0.001	3510 (5380)	818 (946)	<0.001	3990 (8420)	840 (1040)	<0.001	3600 (4810)	852 (950)	<0.001
Median [Q1, Q3]	2020 [1060, 3460]	515 [347, 828]		2460 [1340, 4170]	536 [353, 929]		2580 [1450, 4520]	540 [353, 949]		2440 [1230, 4260]	554 [365, 990]	
Total no. of ED visits from 2020 to 2022												
Mean (SD)	5.44 (6.50)	1.56 (1.70)	<0.001	7.19 (16.8)	1.78 (1.70)	<0.001	8.47 (25.6)	1.85 (1.99)	<0.001	6.53 (6.36)	1.82 (1.75)	<0.001
Median [Q1, Q3]	4.00 [2.00, 6.00]	1.00 [1.00, 2.00]		5.00 [3.00, 8.00]	1.00 [1.00, 2.00]		5.00 [3.00, 9.00]	1.00 [1.00, 2.00]		5.00 [3.00, 8.00]	1.00 [1.00, 2.00]	
Outpatient admissions, no. (%)	3221 (100)	143,030 (82)	<0.001	1049 (99)	34,849 (73)	<0.001	480 (100)	16,276 (76)	<0.001	545 (100)	14,692 (75)	<0.001
Total outpatient gross bill from 2020 to 2022												
Mean (SD)	12,000 (8780)	1600 (2190)	<0.001	11,400 (9260)	1540 (2260)	<0.001	12,000 (9030)	1490 (2150)	<0.001	11,700 (8280)	1590 (2190)	<0.001
Median [Q1, Q3]	11,100 [6360, 15,500]	785 [256, 2000]		10,100 [5200, 14,400]	690 [251, 1790]		10,600 [5960, 16,400]	685 [240, 1770]		10,800 [6050, 15,700]	778 [254, 1940]	
Total outpatient visits from 2020 to 2022												
Mean (SD)	60.5 (40.7)	9.89 (12.6)	<0.001	56.2 (40.9)	8.88 (11.8)	<0.001	65.4 (56.8)	9.22 (12.7)	<0.001	62.2 (44.3)	9.62 (12.4)	<0.001
Median [Q1, Q3]	52.0 [34.0, 78.0]	5.00 [2.00, 13.0]		48.0 [29.0, 73.0]	4.00 [2.00, 11.0]		51.0 [32.0, 81.0]	4.00 [2.00, 11.0]		55.0 [31.0, 81.0]	5.00 [2.00, 12.0]	
Patients who had day surgery, no. (%)	1903 (59)	39,470 (23)	<0.001	573 (54)	7280 (15)	<0.001	270 (56)	3659 (17)	<0.001	316 (58)	3452 (18)	<0.001

Patients who had day surgery (DS1 data)												
Mean (SD)	2.55 (1.92)	1.56 (0.998)	<0.001	2.50 (1.92)	1.54 (1.03)	<0.001	2.65 (2.17)	1.55 (1.06)	<0.001	2.84 (2.10)	1.52 (1.01)	<0.001
Median [Q1, Q3]	2.00 [1.00, 3.00]	1.00 [1.00, 2.00]		2.00 [1.00, 3.00]	1.00 [1.00, 2.00]		2.00 [1.00, 3.00]	1.00 [1.00, 2.00]		2.00 [1.00, 4.00]	1.00 [1.00, 2.00]	
Total day surgery gross bill from 2020 to 2022												
Mean (SD)	5100 (4590)	2930 (3050)	<0.001	5700 (5770)	3130 (3240)	<0.001	5390 (4720)	2800 (3070)	<0.001	5760 (5250)	2930 (3170)	<0.001
Median [Q1, Q3]	3730 [1800, 7310]	2090 [932, 3660]		3780 [1910, 7680]	2150 [927, 3840]		3810 [2120, 7870]	1950 [752, 3660]		3900 [1890, 8160]	1990 [829, 3660]	

DS1: dataset 1; ED: emergency department; LOS: length of stay; PHUs: persistent high utilisers; SD: standard deviation