

Article title: Impact of China's National Volume-Based Drug Procurement: A Multilevel Interrupted Time Series Analysis on Medical Expenditures in Hypertensive Patients

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Figure S1. Study population flowchart

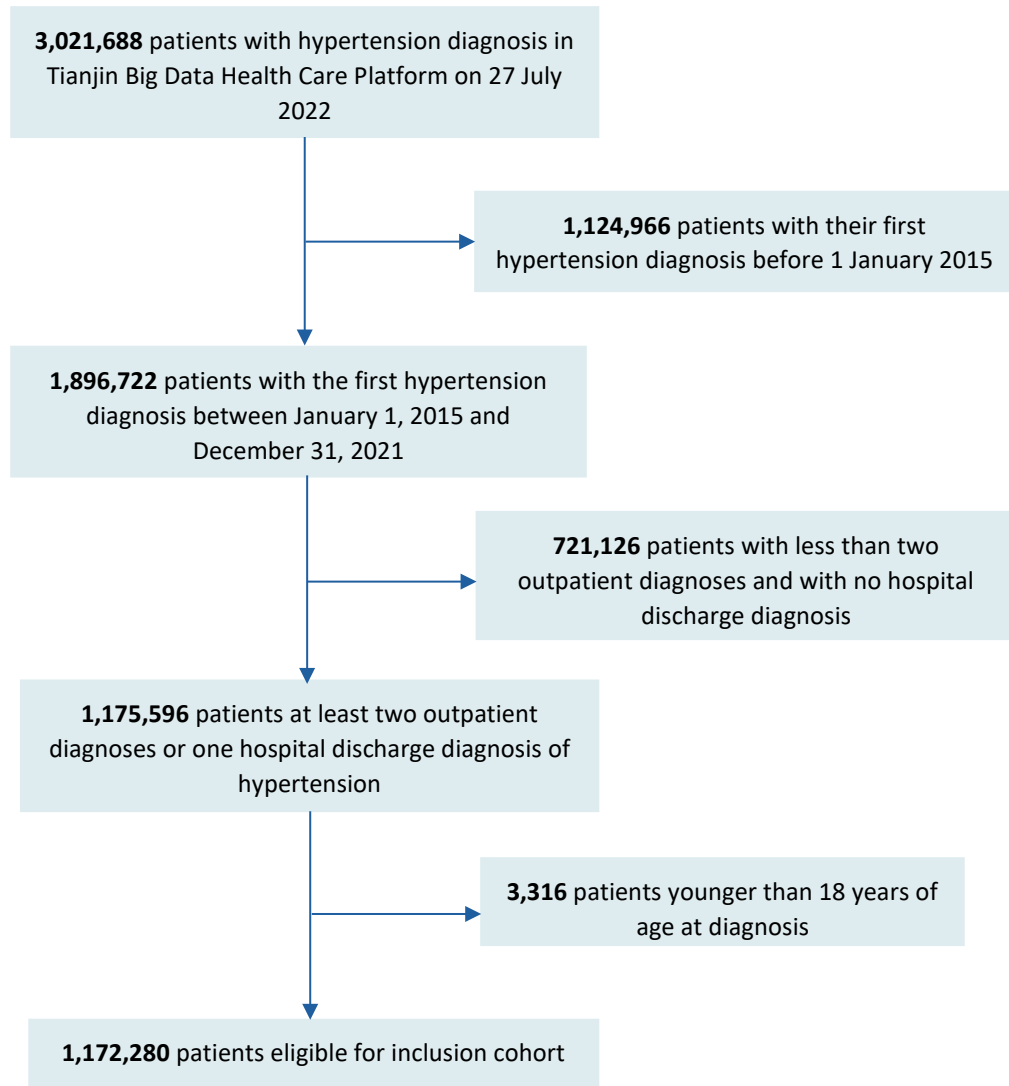


Table S1. Study cohort characteristics

Characteristics	Overall Count (%)	Pre-NVBP Count (%)	Post-NVBP Count (%)
Patients	1,172,280	873,528	108,0815
Year of diagnosis			
2015	229,214 (19.55)	229,214 (26.24)	200,123 (18.52)
2016	217,319 (18.54)	217,319 (24.88)	192,998 (17.86)
2017	208,730 (17.81)	208,730 (23.9)	187,066 (17.31)
2018	174,043 (14.85)	174,043 (19.92)	159,748 (14.78)
2019	155,569 (13.27)	44,222 (5.06)	153,475 (14.2)
2020	107,285 (9.15)	-	107,285 (9.93)

2021	80,120 (6.83)	-	80,120 (7.41)
Sex			
Male	607,819 (51.85)	449,889 (51.5)	557,468 (51.58)
Female	564,461 (48.15)	423,639 (48.5)	523,347 (48.42)
Age, median (IQR)	58 (47-66)	58 (48-66)	57 (47-66)
Age group			
18-25	109,98 (0.94)	6,931 (0.81)	10,079 (0.93)
26-30	34,364 (2.93)	25,516 (2.98)	32,086 (2.97)
31-35	59,352 (5.06)	42,822 (5.01)	56,171 (5.2)
36-40	70,648 (6.03)	49,130 (5.74)	67,010 (6.2)
41-45	80,045 (6.83)	58,981 (6.89)	75,582 (6.99)
46-50	105,539 (9)	76,641 (8.96)	99,476 (9.2)
51-55	150,593 (12.85)	115,607 (13.51)	140,356 (12.99)
56-60	170,638 (14.56)	126,358 (14.77)	159,369 (14.75)
61-65	180,756 (15.42)	132,967 (15.54)	167,749 (15.52)
66-70	129,561 (11.05)	90,164 (10.54)	119,048 (11.01)
71-75	81,766 (6.97)	58,271 (6.81)	73,522 (6.8)
> 75	98,020 (8.36)	72,137 (8.43)	80,363 (7.44)
Cardiovascular history ^a			
Chronic ischaemic heart disease	385,726 (32.9)	307,862 (35.24)	351,014 (32.48)
Cerebrovascular disease	282,638 (24.11)	208,277 (23.84)	255,379 (23.63)
Atrial fibrillation	109,554 (9.35)	80,437 (9.21)	99,564 (9.21)
Angina pectoris	73,421 (6.26)	54,261 (6.21)	67,533 (6.25)
Heart failure	69,784 (5.95)	53,067 (6.08)	60,254 (5.57)
Atherosclerosis	51,045 (4.35)	37,220 (4.26)	47,010 (4.35)
Acute ischaemic heart disease	40,610 (3.46)	26,761 (3.06)	38,196 (3.53)
Myocardial infarction	20,189 (1.72)	13,889 (1.59)	18,142 (1.68)
General medical history ¹			
Dyslipidemia	265,399 (22.64)	196,897 (22.54)	248,126 (22.96)
Diabetes	201,303 (17.17)	150,554 (17.24)	186,334 (17.24)
Skin viral infections	168,434 (14.37)	111,334 (12.75)	160,852 (14.88)
Acute upper respiratory infections	155,485 (13.26)	122,509 (14.02)	145,659 (13.48)
Dizziness and giddiness	150,347 (12.83)	97,834 (11.2)	142,209 (13.16)
Dorsopathies	138,167 (11.79)	101,823 (11.66)	131,232 (12.14)
Gastritis and duodenitis	135,378 (11.55)	100,979 (11.56)	127,539 (11.8)
Intestinal infectious diseases	132,531 (11.31)	90,002 (10.3)	125,826 (11.64)
Respiratory symptoms	119,679 (10.21)	81,754 (9.36)	113,511 (10.5)
Arthropathies	100,217 (8.55)	73,763 (8.44)	95,438 (8.83)
Metabolic disorders	95,336 (8.13)	63,856 (7.31)	85,240 (7.89)
Chronic lower respiratory disease	89,941 (7.67)	69,543 (7.96)	83,224 (7.7)
Liver disease	82,937 (7.07)	60,635 (6.94)	76,931 (7.12)
Digestive and abdominal symptoms	82,010 (7)	55,726 (6.38)	77,983 (7.22)
Sleep disorders	81,047 (6.91)	57,415 (6.57)	76,913 (7.12)
Dermatitis and eczema	52,755 (4.5)	37,028 (4.24)	50,854 (4.71)
Headache	50,033 (4.27)	31,372 (3.59)	47,967 (4.44)
Medication use ^a			
Anti-hypertensive drugs ^b	865,158 (73.8)	652,151 (74.66)	796,353 (73.68)
Calcium channel blockers	478,157 (40.79)	362,911 (41.55)	437,808 (40.51)
ARB blockers	287,792 (24.55)	220,896 (25.29)	266,868 (24.69)
Beta-blockers	228,683 (19.51)	171,961 (19.69)	209,215 (19.36)
Fixed-dose combination	128,154 (10.93)	89,915 (10.29)	118,652 (10.98)

ACEI	99,790 (8.51)	83,425 (9.55)	88,569 (8.19)
Diuretics	72,588 (6.19)	53,967 (6.18)	60,657 (5.61)
Lipid-lowering agents	325,224 (27.74)	244,825 (28.03)	297,148 (27.49)
Antithrombotic agents	321,547 (27.43)	247,748 (28.36)	291,602 (26.98)
Antianginal agents	195,102 (16.64)	154,037 (17.63)	173,596 (16.06)
Oral hypoglycemic agents	133,368 (11.38)	100,558 (11.51)	124,449 (11.51)

ACEI = angiotensin-converting enzyme inhibitors, ARB = angiotensin receptor blockers. ^a Patient was the unite of descriptive analysis, the numerator was the number of patients with according medical diagnoses 12 month before the index data (the time of first being diagnosed with hypertension in database), and the dominator was the number of patients in responding time period. ^b Anti-hypertensive agents included diuretics, calcium channel blockers, angiotensin-converting enzyme inhibitors, angiotensin receptor blockers, renin-inhibitors, beta-blockers, alphaadrenoreceptor antagonists, centrally active drugs, arteriolar smooth muscle, traditional compound drugs and fixed-dose combination drugs.

Table S2. Count of medical visits for different conditions pre- and post-NVBP.

Medical visits	Overall	Pre-NVBP	Post-NVBP
	Jan 2017 – Dec 2021 Count (%)	Jan 2017 – Mar 2019 Count (%)	Apr 2019 – Dec 2021 Count (%)
Medical visits			
Outpatient visits	3,225,890	1,680,124	1,545,766
Inpatient admissions	68,491	42,020	26,471
Outpatient visits by condition			
Hypertension	1,827,617	883,632	943,985
Dyslipidemia	234,076	100,761	133,315
Chronic IHD	475,736	247,033	228,703
Diabetes *	688,461	448,698	239,763
Inpatient admissions by condition			
Chronic IHD	28,729	14,395	14,334
Diabetes *	39,762	27,625	12,137

* The analysis of diabetes data prior to the NVBP extended from January 2017 to April 2020; Chronic IHD = chronic ischaemic heart disease.

Table S3. Summary statistics of outpatient expenditures for different conditions pre- and post-NVBP.

	Pre-NVBP Jan 2017 – Mar 2019 Mean (SD)	Post-NVBP Apr 2019 – Dec 2021 Mean (SD)
Hypertension		
Total	145.89 (5.23)	116.65 (7.58)
Drug	114.83 (2.17)	88.37 (9.12)
Non-drug	17.37 (1.09)	21.41 (3.36)
Dyslipidemia		
Total	159.47 (5.45)	119.29 (6.81)
Drug	124.79 (3.22)	79.3 (2.72)
Non-drug	36.83 (3.88)	44.37 (5.66)
Chronic IHD		
Total	357.11 (24.52)	339.43 (40.93)
Drug	259.13 (27.33)	187.99 (15.87)
Non-drug	61.27 (8.27)	101.55 (33.35)
Diabetes		
Total	352.92 (25.64)	337.52 (12.86)
Drug	274.22 (24.26)	227.12 (7.23)
Non-drug	46.44 (3.53)	60.85 (4.2)

The analysis of diabetes data prior to the NVBP extended from January 2017 to April 2020; Chronic IHD = chronic ischaemic heart disease.

Table S4. Summary statistics of inpatient expenditures for different conditions pre- and post-NVBP

	Pre-NVBP Jan 2017 – Mar 2019 Mean (SD)	Post-NVBP Apr 2019 – Dec 2021 Mean (SD)
Chronic IHD		
Total	12569.01 (498.07)	12114.46 (551.39)
OOP	4735.14 (228.73)	4499.29 (236.91)
Drug	2674.43 (189.8)	2199.13 (293.42)
Diagnostic	3620.78 (93.59)	3640.93 (261.61)
Treat	2654.13 (162.46)	2663.4 (175.05)
Consumable	754.37 (67.02)	963.74 (156.44)
Diabetes		
Total	10501.61 (267.85)	10603.68 (409.88)
OOP	3363.54 (176.75)	3431.24 (132.27)
Drug	2752.84 (171.41)	2228.29 (112.6)
Diagnostic	4065.46 (67.03)	4443.33 (192.19)
Treat	1429.81 (72.83)	1284.41 (97.19)
Consumable	505.38 (75.37)	514.19 (28.36)

The analysis of diabetes data prior to the NVBP extended from January 2017 to April 2020; Chronic IHD = chronic ischaemic heart disease; OOP=out-of-pocket.