

Technical Supplement

Definitions for Healthcare Spending

Healthcare spending included financial claims for all healthcare episodes and definitions for healthcare spending and type of service delivery as below:

Total Cost – total of reimbursed drug and medical costs

Medical Cost – total reimbursed medical costs (also known as medical benefit)

Inpatient Cost – total net reimbursed of inpatient services

Outpatient Cost – total net reimbursed for outpatient services

Speciality Procedure and Diagnostics – total reimbursed for speciality procedures

Primary Care Services – total reimbursed for primary care procedures

Psychiatric Services – total reimbursed for psychiatric service procedures

Emergency Services - total reimbursed for emergency services

Drug cost – total net reimbursed drug cost (also known as pharmacy benefit)

Generic drug cost – total net reimbursed drug cost for drugs categorized as generics

Branded drug cost – total net reimbursed drug cost for branded drugs

Copay – patient out of pocket drug cost

Number of conditions	Number of patients with conditions	Average cost per patient	Number of CCAE patients with conditions	Average cost per CCAE patient	Number of Medicaid Patients with conditions	Average cost per Medicaid patient	Number of Medicare patients with conditions	Average cost per Medicare patient
2	23,551,408	\$ 4,385	18,464,155	\$ 4,532	2,231,793	\$ 3,555	2,855,461	\$ 4,083
3	20,166,132	\$ 5,851	14,520,758	\$ 6,099	1,813,055	\$ 4,935	3,832,319	\$ 5,343
4	16,392,071	\$ 7,735	10,535,366	\$ 8,241	1,511,182	\$ 6,439	4,345,523	\$ 6,960
5	12,804,515	\$ 10,088	7,248,729	\$ 11,070	1,245,461	\$ 7,987	4,310,326	\$ 9,045
6	9,762,840	\$ 12,739	4,849,420	\$ 14,117	1,031,158	\$ 10,256	3,882,263	\$ 11,676
7	7,430,641	\$ 16,247	3,187,880	\$ 18,525	853,450	\$ 12,447	3,389,311	\$ 15,061
8	5,611,530	\$ 19,856	2,059,279	\$ 23,305	695,610	\$ 14,674	2,856,641	\$ 18,632
9	4,290,681	\$ 24,181	1,353,481	\$ 29,509	555,028	\$ 16,920	2,382,172	\$ 22,846
10	3,194,766	\$ 28,646	840,456	\$ 36,379	451,129	\$ 19,772	1,903,182	\$ 27,335
11	2,448,914	\$ 33,874	555,969	\$ 44,098	360,018	\$ 22,540	1,532,927	\$ 32,827

Table 1. Comparison of health spending between insurance type, by number of conditions The data are scaled to the total US Adult 2015 population

	Condition 1	Condition 2	Patient Count (%)
1	HIGH_CHOLESTEROL	HYPERTENSION	281,901 (30.77 %)
2	DIABETES	HYPERTENSION	151,195 (16.23 %)
3	HYPERTENSION	OSTEOARTHRITIS	103,129 (11.07 %)
4	HIGH_CHOLESTEROL	OTHER_ENDOCRINE	101,947 (10.94 %)
5	EYE_PROBLEM	HIGH_CHOLESTEROL	96,062 (10.31 %)
6	HYPERTENSION	OTH_NEURO_DIS	95,260 (10.23%)
7	HYPERTENSION	PUD_EXCLUDE_BLEED	93,537 (10.04 %)
8	ANXIETY	DEPRESSION	89,326 (9.59 %)
9	HIGH_CHOLESTEROL	WEIGHT_LOSS	87,657 (9.41 %)
10	ALLERGY	HYPERTENSION	87,293 (9.37 %)
11	DEPRESSION	HYPERTENSION	84,388 (9.06 %)
12	ALLERGY	HIGH_CHOLESTEROL	79,210 (8.50 %)
13	HYPERTENSION	OBESITY	79,018 (8.48 %)
14	CAD	HYPERTENSION	78,890 (8.47 %)
15	CARDIAC_ARRH	HYPERTENSION	74,290 (7.97 %)
16	DEPRESSION	HIGH_CHOLESTEROL	68,671 (7.37 %)
17	ANXIETY	HIGH_CHOLESTEROL	61,369 (6.59 %)
18	CARDIOMYOPATHY_HEART_DISEASE	HYPERTENSION	61,880 (6.46 %)
19	CARDIOMYOPATHY_HEART_DISEASE	HIGH_CHOLESTEROL	51,295 (5.50 %)
20	DIABETES	OTHER_ENDOCRINE	49,758 (5.344 %)
21	DIABETES	OTH_NEURO_DIS	49,455 (5.31 %)
22	HYPERTENSION	RENAL_FAILURE	44,353 (4.76 %)
23	EYE_PROBLEM	OTHER_ENDOCRINE	41,685 (4.477 %)
24	HYPERTENSION	MALIGNANT_NEOPLASM	41,754 (4.48 %)

25	ALLERGY	EYE_PROBLEM	40,771 (4.37 %)
----	---------	-------------	-----------------

Table 2. Top 25 Cluster Pairs of Conditions according to Prevalence

	Condition 1	Condition 2	Patient Count (%)
1	HYPERTENSION	HIGH_CHOLESTEROL	281,901 (30.28 %)
2	DIABETES	HYPERTENSION	151,195 (16.24 %)
3	DIABETES	HIGH_CHOLESTEROL	133,956 (14.39 %)
4	OSTEOARTHRITIS	HYPERTENSION	103,129 (11.08 %)
5	DEPRESSION	ANXIETY	89,326 (9.59 %)
6	HYPERTENSION	CAD	78,890 (8.47 %)
7	HIGH_CHOLESTEROL	CAD	70,624 (7.59 %)
8	HIGH_CHOLESTEROL	ANXIETY	61,369 (6.59 %)
9	OTH_NEURO_DIS	CHRONIC_PAIN	59,003 (6.34 %)
10	COPD	ALLERGY	44,486 (4.78 %)
11	HYPERTENSION	RENAL_FAILURE	44,353 (4.76 %)
12	DIABETES	CAD	37,264 (4.00 %)
13	COAGULOPATHY	BLOOD_LOSS_ANEMIA	37,943 (4.08 %)
14	CARDIAC_ARRH	CARDIOMYOPATHY_HEART_DISEASE	31,279 (3.36 %)
15	COPD	CAD	26,633 (2.86 %)
16	CARDIAC_ARRH	VALVULAR	24,386 (2.62 %)
17	DEPRESSION	CHRONIC_PAIN	23,897 (2.57 %)
18	DIABETES	RENAL_FAILURE	24,710 (2.65 %)
19	ANXIETY	CHRONIC_PAIN	22,841 (2.45 %)
20	OSTEOARTHRITIS	CHRONIC_PAIN	20,897 (2.24 %)
21	COPD	CHRONIC_PAIN	18,225 (1.96 %)
22	RENAL_FAILURE	CAD	15,656 (1.68 %)

23	RENAL_FAILURE	BLOOD_LOSS_ANEMIA	13,403 (1.44 %)
24	CHF	RENAL_FAILURE	13,256 (1.42 %)
25	WEIGHT_LOSS	CYSTIC_FIBROSIS	8,983 (0.96 %)

Table 3. Top 25 Cluster Pairs of Conditions according to Strength of Association

	Conditions with Strong Associations *(>95%)	Conditions with Moderate Associations *(15-95%)	Patient Count (%)
1	Hypertension High Cholesterol	Other Endocrine Eye Problems	123,203 (13.23%)
2	High Cholesterol	Other Endocrine Weight Loss Allergy	106,549 (11.44%)
3	Hypertension	Diabetes Allergy	96,023 (10.31%)
4	Depression	Anxiety Alcohol Abuse	85,184 (9.15%)
5	Diabetes High Cholesterol Hypertension	Eye Problems Other Endocrine Obesity	73,935 (7.94%)
6	Other Endocrine	Hypertension Weight Loss	62,950 (6.76%)
	Peptic Ulcer Disease Excluding Bleed	Hypertension Allergy	58,446 (6.23%)
8	Hypertension Coronary Artery Disease Cardiomyopathy	Cardiac Arrhythmia Diabetes Eye Problems	54,591 (5.86%)
9	Other Neurological Disorder Chronic Pain	Back Pain Alcohol Abuse	42,121 (4.52%)
10	Hypertension High Cholesterol Other Neurological Disease Depression	COPD Peptic Ulcer Disease Excluding Bleed Diabetes Back Pain Other Endocrine Disease	40,266 (4.32%)

	Osteoarthritis Anxiety		
--	---------------------------	--	--

Table 4. K-Means Clustering of 2 or more Conditions *The second column reports the main chronic conditions that were present in over 95% of patients falling within that cluster; column three reports conditions that were present in 20-95% of patients within that cluster