

Supplemental materials for:

Phillips RL, Petterson SM, Bazemore AW, Wingrove P, Puffer JC. The effects of training institution practice costs, quality, and other characteristics on future practice. *Ann Fam Med*. 2017;15(2):140-148.

Appendix 1: CPT Codes Used to Track Receipt of Preventive Services

Preventive Service	Associated CPT Codes
Hemoglobin A _{1c} testing	83036-83037, 3046F-3047F
Low density lipoprotein screening	80061, 83700, 83701, 83704, 83715, 83716, 83721, 3048F-3050F
Nephropathy testing	82042-82044, 3064F, 3061F
Retinal eye exam	67028, 67038, 67038, 67040, 67101, 67105, 67107, 67108, 67110, 67112, 67141, 67145, 67208, 67210, 67218, 67227, 67228, 92002, 92004, 92012, 92014, 92018, 92019, 92225, 92226, 92230, 92235, 92240, 92260, 2022F, 2024F, 2026F, 3072F

Source: https://innovation.cms.gov/Files/Migrated-Medicare-Demonstration-x/MMA649_DM_EHRS_Algorithm.pdf

Appendix 2. Sample Restrictions

Restriction	# Beneficiaries	#Claims	#Physicians
Full Sample	9,646,594	294,757,633	170,812
Patients 65+	7,690,931	235,355,823	162,937
Exclude No PC visit in 2011	6,746,180	220,361,475	162,936
Plurality of care from Sample PC physician	1,280,202	30,819,396	8,578
Physicians with valid HSA information 1992-2009	553,110	13,657,791	4,310
Matched to 1992-2009 Sponsoring Institution	545,615	13,482,938	4,251
Available 2011 HSA Information	544,197	13,442,088	4,238
Beneficiaries have less than \$100,000 expenditures	516,212	12,649,509	4,062
Physician has more than 30 unique patients	503,109	12,336,046	3,076

* Includes physicians not in sample.

Appendix 3. Sample Characteristics by Training Hospital Service Area Spending

	Training HSA Spending					
	Low		Average		High	
	Unweighted	Weighted	Unweighted	Weighted	Unweighted	Weighted
A. Beneficiaries						
No. of beneficiaries	168,122		167,497		167,490	
Patient Age						
65-74 years	87,299	52.3 (52.1-52.6)	87,349	51.6 (51.3-51.8)	83,616	49.2 (48.9-49.4)
75-84 years	56,381	33.5 (33.3-33.7)	56,428	33.7 (33.5-33.9)	57,128	34.5 (34.3-34.7)
85+ years	24,442	14.2 (14.0-14.3)	23,720	14.7 (14.6-14.9)	26,746	16.3 (16.2-16.5)
Female sex	101,534	60.2 (60.0-60.4)	101,904	61.1 (60.9-61.4)	102,685	61.3 (61.1-61.6)
Patient Race/Ethnicity						
White race	154,360	90.4 (90.3-90.6)	147,649	86.4 (86.2-86.5)	138,084	79.2 (79.0-79.4)
Black race	6,371	5.5 (5.4-5.7)	12,231	8.0 (7.9-8.1)	13,327	7.7 (7.6-7.8)
Other race	2,118	0.9 (0.8-0.9)	1,544	0.7 (0.7-0.8)	1,609	0.8 (0.8-0.9)
Asian race	2,051	1.1 (1.0-1.1)	1,931	1.4 (1.3-1.4)	5,501	4.9 (4.8-5.0)
Hispanic ethnicity	2,979	1.9 (1.8-1.9)	3,911	3.3 (3.2-3.4)	8,677	7.2 (7.1-7.3)
Weighted Charlson Score, median [IQR]		1 (0.0-2)		1 (0.0-2)		1 (0.0-2)
PC visits		6.4 (6.4-6.5)		6.7 (6.7-6.7)		7.0 (7.0-7.1)
B. Physicians						
No. of physicians	1,121		926		1,029	
Care Provided in Hospitals, Mean Percent		9.6 (8.6-10.6)		10.6 (9.5-11.8)		15.9 (14.6-17.3)
Sponsoring Institution Characteristics						
Number of Residents (mean)		79.8 (74.6-84.9)		94.4 (88.4-100.5)		122.2 (114.7-129.6)
Percent of Grads Rural		15.0 (14.3-15.8)		11.1 (10.5-11.7)		6.2 (5.9-6.6)
Percent of Grads Primary Care		51.9 (50.2-53.6)		44.7 (43.0-46.4)		39.7 (38.2-41.2)
Female Physician	422	34.9 (32.1-37.7)	338	36.8 (33.7-39.9)	416	39.8 (36.8-42.8)
Male Physician	699	65.1 (62.3-67.9)	588	63.2 (60.1-66.3)	613	60.2 (57.2-63.2)
International Medical Graduate	131	14.7 (12.6-16.7)	172	21.0 (18.4-23.7)	427	43.1 (40.1-46.2)
US Medical Graduate	990	85.3 (83.3-87.4)	754	79.0 (76.3-81.6)	602	56.9 (53.8-59.9)
General Internal Medicine	309	33.3 (30.5-36.0)	409	50.1 (46.9-53.3)	680	66.2 (63.3-69.1)
Family Medicine	812	66.7 (64.0-69.5)	517	49.9 (46.7-53.1)	349	33.8 (30.9-36.7)
Rural/Urban Location						
Urban	738	73.0 (70.4-75.6)	682	81.4 (78.9-83.9)	871	89.3 (87.4-91.1)
Large Rural	225	17.0 (14.8-19.2)	154	11.8 (9.7-13.9)	110	7.6 (6.0-9.3)

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Small Rural	83	6.1 (4.7-7.6)	56	3.8 (2.6-5.0)	22	1.8 (1.0-2.7)
Isolated Rural	53	2.4 (1.5-3.2)	21	1.6 (0.8-2.5)	13	0.4 (0.0-0.8)
Frontier	20	1.4 (0.7-2.0)	9	1.0 (0.3-1.6)	11	0.6 (0.1-1.1)
Years of Practice						
0 to 7 years	291	21.0 (18.6-23.4)	150	13.9 (11.7-16.2)	131	13.4 (11.3-15.5)
8 to 15 years	606	56.6 (53.7-59.5)	574	62.4 (59.3-65.5)	615	58.4 (55.4-61.4)
16 to 19 years	224	22.4 (19.9-24.8)	202	23.7 (20.9-26.4)	283	28.2 (25.5-31.0)
Practice HSA						
Low	615	44.3 (41.4-47.2)	260	22.6 (19.9-25.3)	253	17.2 (14.9-19.5)
Average	324	31.5 (28.8-34.2)	335	31.7 (28.7-34.7)	355	26.7 (24.0-29.4)
High	182	24.2 (21.7-26.7)	331	45.7 (42.5-48.9)	421	56.1 (53.1-59.2)

HSA: Hospital Service Area; OR: Odds Ratio; CI: Confidence Interval; PC: Primary CareNote. 2011 Medicare Claims; Data is weighted. Data restricted to primary care physicians completing residency between 1992 and 2010 with 30 or more patients. Excluded patients with total expenditures greater than \$100,000. To standardize training HSA spending, we calculated a standardized z score for HSA spending for each years between 1992 and 2010. The Training HSA Spending groups are: Low (-2.06 < z < -0.37), Average (-0.36 < z < 0.52), High (0.51 < z < 4.87).

Supplemental Figure

specialty	Training Institution cost group	practice cost goup	Physician count
FM	LOW	LOW	3838
FM	LOW	AVERAGE	2729
FM	LOW	HIGH	1955
FM	AVERAGE	LOW	1529
FM	AVERAGE	AVERAGE	2160
FM	AVERAGE	HIGH	3044
FM	HIGH	LOW	1303
FM	HIGH	AVERAGE	1870
FM	HIGH	HIGH	3729
GIM	LOW	LOW	1821
GIM	LOW	AVERAGE	1312
GIM	LOW	HIGH	1152
GIM	AVERAGE	LOW	1527
GIM	AVERAGE	AVERAGE	2106
GIM	AVERAGE	HIGH	3159
GIM	HIGH	LOW	2210
GIM	HIGH	AVERAGE	3591
GIM	HIGH	HIGH	7749