

# Population-based Measurement

- Last summer, MHA began to develop a method to measure individual hospitals' impact on a population. At the time, we anticipated the measure to be used as one part of a determination of eligibility for capital
- Since then, several additional policy goals have been discussed:
  - Total cost of care (TCOC) monitoring
  - TCOC guardrail as part of Care Redesign
  - HSCRC “geographic model” an extension of GBR to include non-hospital costs
  - Medicare Performance Adjustment to qualify individual hospitals as Advanced Alternative Payment Models under MACRA, and potentially, direct revenue adjustments under the Progression Plan

# Attribution Approaches

- **PSA Zip-code:** Hospital's primary service areas as indicated on global budget contracts. All beneficiaries and all Medicare spending in those zip-codes are assigned to the hospital. All beneficiaries and spending is attributed
- **Step-wise, or Episode + PSA:** Anchored by a hospital discharge or major outpatient surgery, all Medicare spending within 30 days is attributed to the hospital. Spending not captured in the episodes is attributed based on the PSA approach
- **Beneficiary:** Attribute beneficiaries and their spending based on plurality of hospital utilization and spending. Not all spending and beneficiaries are attributed. To attribute all spending, another approach could be layered on

# Beneficiary Attribution Decisions

- Apply global and case-level exclusions
- Beneficiaries who receive hospital care at only one Maryland hospital or system → attribute to that hospital or system
- Beneficiaries who receive care at one Maryland hospital or system and one out of state hospital → attribute to the Maryland hospital or system
- Beneficiaries who receive inpatient care at two or more Maryland hospitals – consider plurality of visits and total charges. When the hospital with the plurality of visits also has the highest charges, assign to that hospital
- So far, this model only attributes beneficiaries who use hospital services in Maryland. There is more work to do...

# Assessing Hospital-Specific Results

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## Suggested Criteria

- Proportion of attributed costs that are within the hospital's sphere of influence, and the variation in that proportion over time
- Variation in spending per beneficiary across hospitals, and variation at a single hospital over time
- Variation in spending per beneficiary annually across hospitals

# MHA Beneficiary Attribution, CY 2014

	Beneficiaries	Hospital Payments	Beneficiaries' Total Payments	Beneficiaries' Percent of Total Payments	Average Payment per Beneficiary
Same hospital or system	250,146	\$ 2,498 M	\$ 4,171 M	52.6%	\$ 16,675
Attribution based on Majority of payments and plurality of visits	32,936	\$ 1,003 M	\$ 1,459 M	18.4%	\$ 44,288
Attribution based on plurality of payments and visits	15,500	\$ 463 M	\$ 667 M	8.4%	\$ 43,063
No apparent single hospital or system	8,875	\$ 158 M	\$ 249 M	3.1%	\$ 28,011
All encounters are out of state	26,338	\$ 204 M	\$ 369 M	4.7%	\$ 14,016
No hospital utilization	630,319	\$ -	\$ 1,019 M	12.8%	\$ 1,616
Total	964,114	\$ 4,326 M	\$ 7,934 M	100.0%	\$ 8,229

Majority of payments means that at least 50 percent of hospital payments must be made to the target hospital.

# MHA Beneficiary Attribution, CY 2015

	Beneficiaries	Hospital Payments	Beneficiaries' Total Payments	Beneficiaries' Percent of Total Payments	Average Payment per Beneficiary
Same hospital or system	256,720	\$ 2,590 M	\$ 4,357 M	52.1%	\$ 16,972
Attribution based on Majority of payments and plurality of visits	34,532	\$ 1,047 M	\$ 1,532 M	18.3%	\$ 44,372
Attribution based on plurality of payments and visits	16,312	\$ 495 M	\$ 714 M	8.5%	\$ 43,787
No apparent single hospital or system	9,166	\$ 169 M	\$ 268 M	3.2%	\$ 29,241
All encounters are out of state	27,513	\$ 222 M	\$ 400 M	4.8%	\$ 14,538
No hospital utilization	647,797	\$ -	\$ 1,096 M	13.1%	\$ 1,691
Total	992,040	\$ 4,523 M	\$ 8,367 M	100.0%	\$ 8,434

Majority of payments means that at least 50 percent of hospital payments must be made to the target hospital.

**All Inclusive View**

**Statewide Change in Total Payments per Beneficiary from 2014 to 2015 was 0.99%**

Hospital ID	Hospital Name	A	B	C = A-B	D=(B-A)/A
		2014	2015	\$ Change 2014-2015	% Change 2014-2015
		Total Payment per Beneficiary	Total Payment per Beneficiary		
210001	Meritus Medical Center	\$ 18,299	\$ 19,127	\$828	4.5%
210002	University of Maryland Medical Center	\$ 31,346	\$ 30,205	-\$1,141	-3.6%
210003	Prince George's Hospital Center	\$ 17,106	\$ 16,892	-\$214	-1.3%
210004	Holy Cross Hospital	\$ 21,015	\$ 21,178	\$163	0.8%
210005	Frederick Memorial Hospital	\$ 18,582	\$ 18,797	\$215	1.2%
210006	University of Maryland Harford Memorial Hospital	\$ 16,837	\$ 15,615	-\$1,222	-7.3%
210008	Mercy Medical Center	\$ 12,284	\$ 12,221	-\$63	-0.5%
210009	The Johns Hopkins Hospital & Health Center	\$ 19,491	\$ 20,183	\$692	3.6%
210011	Saint Agnes Hospital	\$ 18,307	\$ 18,492	\$185	1.0%
210012	Sinai Hospital of Baltimore	\$ 24,782	\$ 25,210	\$427	1.7%
210013	Bon Secours Baltimore Health System	\$ 23,782	\$ 20,335	-\$3,447	-14.5%
210015	MedStar Franklin Square Medical Center	\$ 20,292	\$ 20,625	\$333	1.6%
210016	Washington Adventist Hospital	\$ 25,148	\$ 25,611	\$463	1.8%
210017	Garrett County Memorial Hospital	\$ 11,295	\$ 11,069	-\$227	-2.0%
210018	MedStar Montgomery Medical Center	\$ 16,739	\$ 16,220	-\$519	-3.1%
210019	Peninsula Regional Medical Center	\$ 20,055	\$ 19,701	-\$354	-1.8%
210022	Suburban Hospital	\$ 18,854	\$ 19,416	\$562	3.0%
210023	Anne Arundel Medical Center	\$ 14,908	\$ 15,282	\$374	2.5%
210024	MedStar Union Memorial Hospital	\$ 18,995	\$ 19,510	\$515	2.7%
210027	Western Maryland Regional Medical Center	\$ 20,997	\$ 20,789	-\$209	-1.0%
210028	MedStar St. Mary's Hospital	\$ 16,016	\$ 16,669	\$653	4.1%
210029	Johns Hopkins Bayview Medical Center	\$ 16,451	\$ 16,351	-\$99	-0.6%
210030	University of Maryland Shore Medical Center at Chestertown	\$ 17,655	\$ 18,191	\$536	3.0%
210032	Union Hospital	\$ 21,178	\$ 20,898	-\$279	-1.3%
210033	Carroll Hospital Center	\$ 17,566	\$ 17,332	-\$234	-1.3%
210034	MedStar Harbor Hospital	\$ 18,837	\$ 18,495	-\$342	-1.8%
210035	University of Maryland Charles Regional Medical Center	\$ 17,040	\$ 19,664	\$2,624	15.4%
210037	University of Maryland Shore Medical Center at Easton	\$ 17,182	\$ 17,018	-\$163	-1.0%
210038	University of Maryland Medical Center Midtown Campus	\$ 16,098	\$ 15,686	-\$412	-2.6%
210039	Calvert Memorial Hospital	\$ 14,732	\$ 15,166	\$434	2.9%
210040	Northwest Hospital	\$ 18,678	\$ 18,919	\$241	1.3%
210043	University of Maryland Baltimore Washington Medical Center	\$ 18,026	\$ 18,358	\$331	1.8%
210044	Greater Baltimore Medical Center	\$ 15,271	\$ 16,039	\$767	5.0%
210045	McCready Hospital	\$ 10,257	\$ 9,645	-\$612	-6.0%
210048	Howard County General Hospital	\$ 16,354	\$ 15,912	-\$442	-2.7%
210049	University of Maryland Upper Chesapeake Medical Center	\$ 17,428	\$ 17,099	-\$329	-1.9%
210051	Doctors' Community Hospital	\$ 20,695	\$ 20,918	\$223	1.1%
210055	Laurel Regional Hospital	\$ 19,974	\$ 20,009	\$35	0.2%
210056	MedStar Good Samaritan Hospital	\$ 20,890	\$ 22,083	\$1,193	5.7%
210057	Adventist HealthCare Shady Grove Medical Center	\$ 17,949	\$ 18,942	\$993	5.5%
210060	Fort Washington Medical Center	\$ 11,737	\$ 11,634	-\$104	-0.9%
210061	Atlantic General Hospital	\$ 11,016	\$ 10,648	-\$368	-3.3%
210062	MedStar Southern Maryland Hospital Center	\$ 22,065	\$ 22,701	\$636	2.9%
210063	University of Maryland St. Joseph Medical Center	\$ 17,670	\$ 19,296	\$1,627	9.2%
210064	Levindale Hebrew Geriatric Hospital	\$ 55,862	\$ 49,674	-\$6,188	-11.1%
210065	Holy Cross Germantown Hospital	\$ 10,524	\$ 14,050	\$3,526	33.5%
Shared	Adventist HealthCare System	\$ 29,351	\$ 31,706	\$2,355	8.0%
Shared	Johns Hopkins Health System	\$ 22,046	\$ 23,550	\$1,504	6.8%
Shared	LifeBridge Health System	\$ 31,672	\$ 32,517	\$845	2.7%
Shared	Medstar Health System	\$ 25,644	\$ 28,163	\$2,519	9.8%
Shared	University of Maryland Medical System	\$ 28,983	\$ 29,234	\$251	0.9%
Minimum:		\$10,257	\$9,645	-\$6,188	-14.5%
Maximum:		\$55,862	\$49,674	\$3,526	33.5%
Average:		\$18,832	\$18,867	\$35	1.0%
Median:		\$17,988	\$18,646	\$174	0.9%

## ALTERNATIVE VIEW

**Bon Secours, UMD Charles Regional, McCready, Levindale, and Holy Cross Germantown removed from summary statistics. With these exemptions, the statewide change in Total Payments per Beneficiary from 2014 to 2015 was 0.87%**

Hospital ID	Hospital Name	A	B	C = A-B	D=(B-A)/A
		2014	2015	\$ Change 2014 - 2015	% Change 2014 - 2015
210001	Meritus Medical Center	\$ 18,299	\$ 19,127	\$828	4.5%
210002	University of Maryland Medical Center	\$ 31,346	\$ 30,205	-\$1,141	-3.6%
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210027	Western Maryland Regional Medical Center	\$ 20,997	\$ 20,789	-\$209	-1.0%
210028	MedStar St. Mary's Hospital	\$ 16,016	\$ 16,669	\$653	4.1%
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Shared	University of Maryland Medical System	\$ 28,983	\$ 29,234	\$251	0.9%
	Minimum:	\$11,016	\$10,648	-\$1,222	-7.3%
	Maximum:	\$31,346	\$30,205	\$1,627	9.2%
	Average:	\$18,263	\$18,403	\$139	0.7%
	Median:	\$18,026	\$18,495	\$185	1.0%



Hospital ID	Hospital Name	Hospital Payments				Non-Hospital Payments					
		To Target Hospital	To Other Hospitals in System	To Any Other Hospital	Hospital Total	Target Hospital % of Total	Associated w/ Target Hospital Discharge	Not Associated	Non-Hospital Total	Associated w/ Hospital % of Total	Total Payment per Beneficiary
210001	Meritus Medical Center	\$ 77,087,147		\$ 16,343,675	\$ 93,430,822	82.5%	\$ 29,988,381	\$ 20,904,411	\$ 50,892,792	58.9%	\$ 18,299
210002	University of Maryland Medical Center	\$ 90,814,454	\$ 39,237,691	\$ 94,810,715	\$ 224,862,860	57.8%	\$ 25,598,587	\$ 22,221,200	\$ 47,819,787	53.5%	\$ 31,346
210003	Prince George's Hospital Center	\$ 25,613,520		\$ 17,639,216	\$ 43,252,736	59.2%	\$ 10,793,941	\$ 7,295,357	\$ 18,089,298	59.7%	\$ 17,106
210004	Holy Cross Hospital	\$ 56,448,462		\$ 28,627,023	\$ 85,075,484	66.4%	\$ 31,199,757	\$ 21,627,291	\$ 52,827,048	59.1%	\$ 21,015
210005	Frederick Memorial Hospital	\$ 87,716,088		\$ 20,793,636	\$ 108,509,724	80.8%	\$ 35,870,693	\$ 25,418,490	\$ 61,289,183	58.5%	\$ 18,582
210006	University of Maryland Harford Memorial Hospital	\$ 17,017,820	\$ 12,517,174	\$ 6,897,363	\$ 36,432,330	81.1%	\$ 10,942,417	\$ 5,662,839	\$ 16,605,257	65.9%	\$ 16,837
210008	Mercy Medical Center	\$ 53,210,625		\$ 56,899,974	\$ 110,110,599	48.3%	\$ 17,391,688	\$ 11,451,838	\$ 28,843,526	60.3%	\$ 12,284
210009	The Johns Hopkins Hospital & Health Center	\$ 116,466,901	\$ 35,761,966	\$ 128,090,303	\$ 280,319,171	54.3%	\$ 29,883,985	\$ 24,976,185	\$ 54,860,171	54.5%	\$ 19,491
210011	Saint Agnes Hospital	\$ 68,176,245		\$ 41,691,027	\$ 109,867,272	62.1%	\$ 27,294,637	\$ 17,056,924	\$ 44,351,561	61.5%	\$ 18,307
210012	Sinai Hospital of Baltimore	\$ 76,918,804	\$ 21,200,499	\$ 50,819,566	\$ 148,938,870	65.9%	\$ 27,063,496	\$ 18,638,271	\$ 45,701,768	59.2%	\$ 24,782
210013	Bon Secours Baltimore Health System	\$ 6,202,353		\$ 8,752,535	\$ 14,954,889	41.5%	\$ 2,031,436	\$ 1,516,028	\$ 3,547,463	57.3%	\$ 23,782
210015	MedStar Franklin Square Medical Center	\$ 80,669,739	\$ 10,887,731	\$ 43,898,841	\$ 135,456,310	67.6%	\$ 34,180,271	\$ 23,559,495	\$ 57,739,766	59.2%	\$ 20,292
210016	Washington Adventist Hospital	\$ 36,843,771	\$ 790,309	\$ 16,159,254	\$ 53,793,334	70.0%	\$ 15,602,199	\$ 12,158,215	\$ 27,760,414	56.2%	\$ 25,148
210017	Garrett County Memorial Hospital	\$ 13,545,074		\$ 2,806,540	\$ 16,351,613	82.8%	\$ 3,730,034	\$ 2,091,161	\$ 5,821,195	64.1%	\$ 11,295
210018	MedStar Montgomery Medical Center	\$ 39,321,432	\$ 107,065	\$ 20,414,952	\$ 59,843,450	65.9%	\$ 22,046,054	\$ 13,621,655	\$ 35,667,709	61.8%	\$ 16,739
210019	Peninsula Regional Medical Center	\$ 91,569,798		\$ 24,174,182	\$ 115,743,980	79.1%	\$ 29,630,752	\$ 20,322,056	\$ 49,952,808	59.3%	\$ 20,055
210022	Suburban Hospital	\$ 64,626,158	\$ 1,772,720	\$ 15,044,008	\$ 81,442,886	81.5%	\$ 32,104,058	\$ 22,899,136	\$ 55,003,194	58.4%	\$ 18,854
210023	Anne Arundel Medical Center	\$ 114,571,486		\$ 44,374,159	\$ 158,945,645	72.1%	\$ 49,512,474	\$ 30,451,976	\$ 79,964,449	61.9%	\$ 14,908
210024	MedStar Union Memorial Hospital	\$ 53,735,635	\$ 7,400,977	\$ 30,766,034	\$ 91,902,646	66.5%	\$ 16,272,158	\$ 10,087,920	\$ 26,360,078	61.7%	\$ 18,995
210027	Western Maryland Regional Medical Center	\$ 88,935,233		\$ 9,800,458	\$ 98,735,692	90.1%	\$ 18,669,061	\$ 15,529,233	\$ 34,198,294	54.6%	\$ 20,997
210028	MedStar St. Mary's Hospital	\$ 42,966,962	\$ 1,156,413	\$ 11,298,267	\$ 55,421,641	79.6%	\$ 13,233,827	\$ 9,678,379	\$ 22,912,206	57.8%	\$ 16,016
210029	Johns Hopkins Bayview Medical Center	\$ 63,780,517	\$ 23,575,935	\$ 55,919,277	\$ 143,275,729	61.0%	\$ 25,597,501	\$ 17,678,523	\$ 43,276,024	59.1%	\$ 16,451
210030	University of Maryland Shore Medical Center at Chestertown	\$ 18,753,761	\$ 7,267,367	\$ 3,264,205	\$ 29,285,333	88.9%	\$ 6,518,212	\$ 3,743,156	\$ 10,261,368	63.5%	\$ 17,655
210032	Union Hospital	\$ 44,424,409		\$ 8,649,643	\$ 53,074,052	83.7%	\$ 14,318,718	\$ 8,083,968	\$ 22,402,685	63.9%	\$ 21,178
210033	Carroll Hospital Center	\$ 67,794,166	\$ 6,430,461	\$ 24,017,991	\$ 98,242,617	75.6%	\$ 25,032,984	\$ 17,008,834	\$ 42,041,818	59.5%	\$ 17,566
210034	MedStar Harbor Hospital	\$ 23,981,585	\$ 1,455,910	\$ 12,583,659	\$ 38,021,154	66.9%	\$ 7,808,214	\$ 4,917,302	\$ 12,725,516	61.4%	\$ 18,837
210035	University of Maryland Charles Regional Medical Center	\$ 36,929,923	\$ 2,171,319	\$ 15,616,060	\$ 54,717,301	71.5%	\$ 16,348,414	\$ 11,271,536	\$ 27,619,950	59.2%	\$ 17,040
210037	University of Maryland Shore Medical Center at Easton	\$ 78,500,602	\$ 13,044,883	\$ 16,185,081	\$ 107,730,566	85.0%	\$ 26,633,524	\$ 17,848,343	\$ 44,481,867	59.9%	\$ 17,182
210038	University of Maryland Medical Center Midtown Campus	\$ 13,707,615	\$ 5,846,765	\$ 18,152,152	\$ 37,706,533	51.9%	\$ 5,810,548	\$ 4,729,572	\$ 10,540,120	55.1%	\$ 16,098
210039	Calvert Memorial Hospital	\$ 36,467,723		\$ 12,930,890	\$ 49,398,614	73.8%	\$ 11,776,085	\$ 7,697,465	\$ 19,473,550	60.5%	\$ 14,732
210040	Northwest Hospital	\$ 35,695,857	\$ 22,164,767	\$ 23,973,009	\$ 81,833,633	70.7%	\$ 22,033,609	\$ 14,456,733	\$ 36,490,342	60.4%	\$ 18,678
210043	University of Maryland Baltimore Washington Medical Center	\$ 86,261,980	\$ 9,569,302	\$ 29,923,471	\$ 125,754,753	76.2%	\$ 37,225,610	\$ 25,576,500	\$ 62,802,110	59.3%	\$ 18,026
210044	Greater Baltimore Medical Center	\$ 56,326,651		\$ 34,877,433	\$ 91,204,084	61.8%	\$ 23,721,087	\$ 15,049,237	\$ 38,770,324	61.2%	\$ 15,271
210045	McCready Hospital	\$ 3,645,592		\$ 4,501,159	\$ 8,146,751	44.7%	\$ 1,642,660	\$ 857,454	\$ 2,500,114	65.7%	\$ 10,257
210048	Howard County General Hospital	\$ 49,535,990	\$ 6,781,016	\$ 16,792,380	\$ 73,109,386	77.0%	\$ 26,109,091	\$ 18,038,009	\$ 44,147,100	59.1%	\$ 16,354
210049	University of Maryland Upper Chesapeake Medical Center	\$ 58,834,770	\$ 16,794,738	\$ 22,484,492	\$ 98,114,001	77.1%	\$ 27,679,890	\$ 14,170,943	\$ 41,850,834	66.1%	\$ 17,428
210051	Doctors' Community Hospital	\$ 42,581,129		\$ 25,194,270	\$ 67,775,399	62.8%	\$ 21,591,713	\$ 15,306,961	\$ 36,898,674	58.5%	\$ 20,695
210055	Laurel Regional Hospital	\$ 17,018,869		\$ 8,839,963	\$ 25,858,832	65.8%	\$ 6,826,573	\$ 5,484,825	\$ 12,311,398	55.4%	\$ 19,974
210056	MedStar Good Samaritan Hospital	\$ 52,571,608	\$ 11,097,077	\$ 32,370,954	\$ 96,039,638	66.3%	\$ 20,444,216	\$ 12,388,415	\$ 32,832,631	62.3%	\$ 20,890
210057	Adventist HealthCare Shady Grove Medical Center	\$ 63,500,389	\$ 1,254,401	\$ 20,220,026	\$ 84,974,816	76.2%	\$ 32,738,717	\$ 23,816,644	\$ 56,553,361	57.9%	\$ 17,949
210060	Fort Washington Medical Center	\$ 14,189,522		\$ 6,881,689	\$ 21,071,212	67.3%	\$ 7,095,003	\$ 4,769,085	\$ 11,864,088	59.8%	\$ 11,737
210061	Atlantic General Hospital	\$ 22,343,928		\$ 13,645,985	\$ 35,989,913	62.1%	\$ 9,074,244	\$ 5,742,846	\$ 14,817,090	61.2%	\$ 11,016
210062	MedStar Southern Maryland Hospital Center	\$ 55,644,961	\$ 234,091	\$ 23,664,393	\$ 79,543,446	70.2%	\$ 22,123,593	\$ 15,941,039	\$ 38,064,632	58.1%	\$ 22,065
210063	University of Maryland St. Joseph Medical Center	\$ 59,904,979	\$ 3,334,476	\$ 28,225,054	\$ 91,464,509	69.1%	\$ 23,568,662	\$ 15,261,828	\$ 38,830,490	60.7%	\$ 17,670
210064	Levindale Hebrew Geriatric Hospital	\$ 7,022,189	\$ 862,825	\$ 1,252,403	\$ 9,137,417	86.3%	\$ 1,289,620	\$ 1,192,355	\$ 2,481,975	52.0%	\$ 55,862
210065	Holy Cross Germantown Hospital	\$ 990,596		\$ 158,952	\$ 1,149,548	86.2%	\$ 358,971	\$ 301,576	\$ 660,547	54.3%	\$ 10,524
Shared	Adventist HealthCare System	\$ 11,954,948		\$ 916,365	\$ 12,871,313	92.9%	\$ 3,982,400	\$ 2,899,652	\$ 6,882,052	57.9%	\$ 29,351
Shared	Johns Hopkins Health System	\$ 41,376,658		\$ 7,589,723	\$ 48,966,380	84.5%	\$ 9,907,537	\$ 8,366,479	\$ 18,274,015	54.2%	\$ 22,046
Shared	LifeBridge Health System	\$ 27,160,930		\$ 14,504,774	\$ 41,665,704	65.2%	\$ 9,468,355	\$ 6,699,792	\$ 16,168,147	58.6%	\$ 31,672
Shared	MedStar Health System	\$ 41,089,498		\$ 7,132,627	\$ 48,222,125	85.2%	\$ 12,889,676	\$ 8,897,454	\$ 21,787,130	59.2%	\$ 25,644
Shared	University of Maryland Medical System	\$ 63,335,143		\$ 23,001,117	\$ 86,336,260	73.4%	\$ 17,663,835	\$ 13,469,669	\$ 31,133,504	56.7%	\$ 28,983

Hospital ID	Hospital Name	Hospital Payments					Non-Hospital Payments				
		To Target Hospital	To Other Hospitals in System	To Any Other Hospital	Hospital Total	Target Hospital % of Total	Associated w/ Target Hospital Discharge	Not Associated	Non-Hospital Total	Associated w/ Hospital % of Total	Total Payment per Beneficiary
210001	Meritus Medical Center	\$ 83,822,932		\$ 17,696,308	\$ 101,519,240	82.6%	\$ 31,997,783	\$ 23,343,538	\$ 55,341,321	57.8%	\$ 19,127
210002	University of Maryland Medical Center	\$ 91,382,915	\$ 36,232,866	\$ 93,627,870	\$ 221,243,651	57.7%	\$ 23,167,520	\$ 21,393,304	\$ 44,560,824	52.0%	\$ 30,205
210003	Prince George's Hospital Center	\$ 26,786,366		\$ 17,911,510	\$ 44,697,875	59.9%	\$ 12,323,170	\$ 7,843,068	\$ 20,166,238	61.1%	\$ 16,892
210004	Holy Cross Hospital	\$ 53,881,625		\$ 27,665,114	\$ 81,546,739	66.1%	\$ 30,303,422	\$ 20,045,306	\$ 50,348,727	60.2%	\$ 21,178
210005	Frederick Memorial Hospital	\$ 86,696,507		\$ 23,054,380	\$ 109,750,887	79.0%	\$ 37,178,485	\$ 27,127,928	\$ 64,306,413	57.8%	\$ 18,797
210006	University of Maryland Harford Memorial Hospital	\$ 17,268,910	\$ 9,646,366	\$ 6,567,060	\$ 33,482,336	80.4%	\$ 10,106,127	\$ 5,223,996	\$ 15,330,123	65.9%	\$ 15,615
210008	Mercy Medical Center	\$ 55,889,829		\$ 61,317,250	\$ 117,207,080	47.7%	\$ 18,383,908	\$ 12,620,765	\$ 31,004,674	59.3%	\$ 12,221
210009	The Johns Hopkins Hospital & Health Center	\$ 135,612,815	\$ 36,728,429	\$ 130,014,562	\$ 302,355,806	57.0%	\$ 32,116,920	\$ 26,192,627	\$ 58,309,547	55.1%	\$ 20,183
210011	Saint Agnes Hospital	\$ 73,210,686		\$ 43,056,004	\$ 116,266,689	63.0%	\$ 28,033,375	\$ 17,231,656	\$ 45,260,531	61.9%	\$ 18,492
210012	Sinai Hospital of Baltimore	\$ 80,257,612	\$ 22,814,803	\$ 52,884,480	\$ 155,956,895	66.1%	\$ 27,895,429	\$ 17,951,726	\$ 45,847,155	60.8%	\$ 25,210
210013	Bon Secours Baltimore Health System	\$ 4,504,086		\$ 8,080,346	\$ 12,584,432	35.8%	\$ 2,174,757	\$ 1,793,244	\$ 3,968,001	54.8%	\$ 20,335
210015	MedStar Franklin Square Medical Center	\$ 81,722,864	\$ 9,683,862	\$ 44,519,409	\$ 135,926,135	67.2%	\$ 34,810,566	\$ 25,922,476	\$ 60,733,042	57.3%	\$ 20,625
210016	Washington Adventist Hospital	\$ 37,840,620	\$ 547,649	\$ 18,239,380	\$ 56,627,649	67.8%	\$ 16,310,298	\$ 12,089,130	\$ 28,399,429	57.4%	\$ 25,611
210017	Garrett County Memorial Hospital	\$ 14,030,565		\$ 2,845,640	\$ 16,876,205	83.1%	\$ 4,019,893	\$ 2,613,431	\$ 6,633,323	60.6%	\$ 11,069
210018	MedStar Montgomery Medical Center	\$ 42,033,922	\$ 41,455	\$ 15,786,326	\$ 57,861,703	72.7%	\$ 21,777,237	\$ 12,312,479	\$ 34,089,715	63.9%	\$ 16,220
210019	Peninsula Regional Medical Center	\$ 90,628,294		\$ 28,099,058	\$ 118,727,351	76.3%	\$ 27,440,517	\$ 21,842,478	\$ 49,282,995	55.7%	\$ 19,701
210022	Suburban Hospital	\$ 64,837,726	\$ 1,534,857	\$ 15,724,850	\$ 82,097,433	80.8%	\$ 34,982,552	\$ 22,036,227	\$ 57,018,778	61.4%	\$ 19,416
210023	Anne Arundel Medical Center	\$ 116,452,116		\$ 50,094,811	\$ 166,546,927	69.9%	\$ 52,711,405	\$ 32,800,330	\$ 85,511,735	61.6%	\$ 15,282
210024	MedStar Union Memorial Hospital	\$ 54,174,869	\$ 8,035,551	\$ 29,779,203	\$ 91,989,623	67.6%	\$ 15,006,405	\$ 10,297,293	\$ 25,303,698	59.3%	\$ 19,510
210027	Western Maryland Regional Medical Center	\$ 87,561,749		\$ 11,589,176	\$ 99,150,925	88.3%	\$ 18,949,921	\$ 16,505,092	\$ 35,455,013	53.4%	\$ 20,789
210028	MedStar St. Mary's Hospital	\$ 46,287,596	\$ 1,479,928	\$ 12,162,801	\$ 59,300,325	79.7%	\$ 15,410,743	\$ 10,101,855	\$ 25,512,598	60.4%	\$ 16,669
210029	Johns Hopkins Bayview Medical Center	\$ 58,042,182	\$ 24,622,136	\$ 65,772,049	\$ 148,436,368	55.7%	\$ 26,070,536	\$ 18,079,612	\$ 44,150,147	59.0%	\$ 16,351
210030	University of Maryland Shore Medical Center at Chestertown	\$ 19,510,883	\$ 5,466,906	\$ 3,399,150	\$ 28,376,938	88.0%	\$ 7,149,316	\$ 4,330,272	\$ 11,479,589	62.3%	\$ 18,191
210032	Union Hospital	\$ 47,361,496		\$ 8,183,576	\$ 55,545,072	85.3%	\$ 15,775,749	\$ 9,032,798	\$ 24,808,546	63.6%	\$ 20,898
210033	Carroll Hospital Center	\$ 71,021,066	\$ 7,155,525	\$ 22,835,602	\$ 101,012,193	77.4%	\$ 27,995,665	\$ 17,689,575	\$ 45,685,241	61.3%	\$ 17,332
210034	MedStar Harbor Hospital	\$ 20,492,403	\$ 2,624,288	\$ 12,731,846	\$ 35,848,537	64.5%	\$ 7,919,592	\$ 4,781,135	\$ 12,700,727	62.4%	\$ 18,495
210035	University of Maryland Charles Regional Medical Center	\$ 44,276,736	\$ 1,997,293	\$ 19,848,640	\$ 66,122,669	70.0%	\$ 20,446,561	\$ 12,123,102	\$ 32,569,663	62.8%	\$ 19,664
210037	University of Maryland Shore Medical Center at Easton	\$ 78,889,290	\$ 14,012,140	\$ 17,274,797	\$ 110,176,227	84.3%	\$ 27,130,680	\$ 18,257,884	\$ 45,388,564	59.8%	\$ 17,018
210038	University of Maryland Medical Center Midtown Campus	\$ 13,552,047	\$ 6,011,274	\$ 19,922,012	\$ 39,485,333	49.5%	\$ 4,895,064	\$ 4,732,718	\$ 9,627,783	50.8%	\$ 15,686
210039	Calvert Memorial Hospital	\$ 37,670,032		\$ 15,032,609	\$ 52,702,640	71.5%	\$ 12,950,944	\$ 9,051,797	\$ 22,002,741	58.9%	\$ 15,166
210040	Northwest Hospital	\$ 38,109,680	\$ 19,566,935	\$ 23,868,394	\$ 81,545,010	70.7%	\$ 23,868,389	\$ 14,513,679	\$ 38,382,069	62.2%	\$ 18,919
210043	University of Maryland Baltimore Washington Medical Center	\$ 85,675,715	\$ 9,838,068	\$ 38,324,111	\$ 133,837,895	71.4%	\$ 38,662,709	\$ 28,204,520	\$ 66,867,228	57.8%	\$ 18,358
210044	Greater Baltimore Medical Center	\$ 59,536,100		\$ 38,605,826	\$ 98,141,926	60.7%	\$ 25,399,774	\$ 15,867,198	\$ 41,266,972	61.5%	\$ 16,039
210045	McCready Hospital	\$ 3,529,509		\$ 4,943,878	\$ 8,473,387	41.7%	\$ 1,290,326	\$ 855,566	\$ 2,145,892	60.1%	\$ 9,645
210048	Howard County General Hospital	\$ 48,541,664	\$ 6,899,352	\$ 17,493,492	\$ 72,934,509	76.0%	\$ 27,015,345	\$ 18,673,135	\$ 45,688,480	59.1%	\$ 15,912
210049	University of Maryland Upper Chesapeake Medical Center	\$ 64,588,563	\$ 18,185,047	\$ 20,586,958	\$ 103,360,568	80.1%	\$ 31,788,353	\$ 17,422,318	\$ 49,210,671	64.6%	\$ 17,099
210051	Doctors' Community Hospital	\$ 41,631,880		\$ 28,646,235	\$ 70,278,116	59.2%	\$ 24,166,119	\$ 15,083,469	\$ 39,249,587	61.6%	\$ 20,918
210055	Laurel Regional Hospital	\$ 15,452,270		\$ 8,304,243	\$ 23,756,513	65.0%	\$ 6,842,896	\$ 5,336,291	\$ 12,179,187	56.2%	\$ 20,009
210056	MedStar Good Samaritan Hospital	\$ 49,263,500	\$ 12,836,220	\$ 40,000,472	\$ 102,100,192	60.8%	\$ 21,633,140	\$ 12,764,594	\$ 34,397,734	62.9%	\$ 22,083
210057	Adventist HealthCare Shady Grove Medical Center	\$ 66,182,601	\$ 885,234	\$ 21,810,985	\$ 88,878,820	75.5%	\$ 30,031,428	\$ 21,092,528	\$ 51,123,956	58.7%	\$ 18,942
210060	Fort Washington Medical Center	\$ 15,285,613		\$ 6,667,801	\$ 21,953,414	69.6%	\$ 7,087,433	\$ 5,371,394	\$ 12,458,827	56.9%	\$ 11,634
210061	Atlantic General Hospital	\$ 22,604,584		\$ 11,439,488	\$ 34,044,071	66.4%	\$ 8,443,630	\$ 6,301,327	\$ 14,744,958	57.3%	\$ 10,648
210062	MedStar Southern Maryland Hospital Center	\$ 57,788,560	\$ 271,892	\$ 21,858,013	\$ 79,918,465	72.6%	\$ 23,355,780	\$ 15,814,933	\$ 39,170,714	59.6%	\$ 22,701
210063	University of Maryland St. Joseph Medical Center	\$ 69,107,001	\$ 3,761,604	\$ 31,315,889	\$ 104,184,494	69.9%	\$ 24,790,772	\$ 15,379,629	\$ 40,170,401	61.7%	\$ 19,296
210064	Levindale Hebrew Geriatric Hospital	\$ 8,265,449	\$ 1,707,855	\$ 2,640,967	\$ 12,614,271	79.1%	\$ 1,473,815	\$ 1,857,427	\$ 3,331,242	44.2%	\$ 49,674
210065	Holy Cross Germantown Hospital	\$ 6,560,105		\$ 3,827,632	\$ 10,387,737	63.2%	\$ 4,521,642	\$ 2,596,937	\$ 7,118,579	63.5%	\$ 14,050
Shared	Adventist HealthCare System	\$ 11,954,948		\$ 916,365	\$ 12,871,313	92.9%	\$ 5,106,678	\$ 4,274,985	\$ 9,381,663	54.4%	\$ 31,706
Shared	Johns Hopkins Health System	\$ 41,376,658		\$ 7,589,723	\$ 48,966,380	84.5%	\$ 11,230,347	\$ 9,703,624	\$ 20,933,971	53.6%	\$ 23,550
Shared	LifeBridge Health System	\$ 27,160,930		\$ 14,504,774	\$ 41,665,704	65.2%	\$ 9,868,341	\$ 6,874,080	\$ 16,742,421	58.9%	\$ 32,517
Shared	MedStar Health System	\$ 41,089,498		\$ 7,132,627	\$ 48,222,125	85.2%	\$ 13,660,561	\$ 9,767,903	\$ 23,428,463	58.3%	\$ 28,163
Shared	University of Maryland Medical System	\$ 63,335,143		\$ 23,001,117	\$ 86,336,260	73.4%	\$ 19,577,412	\$ 13,729,142	\$ 33,306,554	58.8%	\$ 29,234

Impact of Removing High and Low Outliers

Hospital ID	Hospital Name	Target Hospital % of Total		Associated w/ Hospital % of Total		Total Payment per Beneficiary	
		Before	After	Before	After	Before	After
210001	Meritus Medical Center	82.5%	85.9%	58.9%	58.4%	\$18,299	\$17,105
210002	University of Maryland Medical Center	57.8%	61.0%	53.5%	52.1%	\$31,346	\$22,995
210003	Prince George's Hospital Center	59.2%	63.4%	59.7%	58.8%	\$17,106	\$15,021
210004	Holy Cross Hospital	66.4%	69.7%	59.1%	58.3%	\$21,015	\$19,099
210005	Frederick Memorial Hospital	80.8%	83.2%	58.5%	57.9%	\$18,582	\$17,585
210006	University of Maryland Harford Memorial Hospital	81.1%	83.1%	65.9%	65.1%	\$16,837	\$15,604
210008	Mercy Medical Center	48.3%	50.8%	60.3%	59.4%	\$12,284	\$12,899
210009	The Johns Hopkins Hospital & Health Center	54.3%	58.3%	54.5%	52.3%	\$19,491	\$15,630
210011	Saint Agnes Hospital	62.1%	65.4%	61.5%	61.3%	\$18,307	\$16,600
210012	Sinai Hospital of Baltimore	65.9%	68.4%	59.2%	58.4%	\$24,782	\$21,551
210013	Bon Secours Baltimore Health System	41.5%	46.1%	57.3%	56.4%	\$23,782	\$16,871
210015	MedStar Franklin Square Medical Center	67.6%	70.5%	59.2%	58.8%	\$20,292	\$18,438
210016	Washington Adventist Hospital	70.0%	74.7%	56.2%	55.0%	\$25,148	\$21,951
210017	Garrett County Memorial Hospital	82.8%	83.6%	64.1%	64.2%	\$11,295	\$11,325
210018	MedStar Montgomery Medical Center	65.9%	68.8%	61.8%	61.4%	\$16,739	\$15,729
210019	Peninsula Regional Medical Center	79.1%	82.9%	59.3%	58.7%	\$20,055	\$18,912
210022	Suburban Hospital	81.5%	83.6%	58.4%	58.2%	\$18,854	\$18,087
210023	Anne Arundel Medical Center	72.1%	74.4%	61.9%	61.7%	\$14,908	\$14,276
210024	MedStar Union Memorial Hospital	66.5%	70.3%	61.7%	60.5%	\$18,995	\$16,493
210027	Western Maryland Regional Medical Center	90.1%	91.9%	54.6%	53.6%	\$20,997	\$19,793
210028	MedStar St. Mary's Hospital	79.6%	83.1%	57.8%	56.2%	\$16,016	\$14,568
210029	Johns Hopkins Bayview Medical Center	61.0%	61.8%	59.1%	58.3%	\$16,451	\$14,536
210030	University of Maryland Shore Medical Center at Chestertown	88.9%	90.4%	63.5%	62.8%	\$17,655	\$16,084
210032	Union Hospital	83.7%	87.6%	63.9%	62.6%	\$21,178	\$18,904
210033	Carroll Hospital Center	75.6%	79.1%	59.5%	58.6%	\$17,566	\$16,515
210034	MedStar Harbor Hospital	66.9%	70.1%	61.4%	60.4%	\$18,837	\$16,866
210035	University of Maryland Charles Regional Medical Center	71.5%	75.8%	59.2%	58.0%	\$17,040	\$15,573
210037	University of Maryland Shore Medical Center at Easton	85.0%	86.8%	59.9%	59.0%	\$17,182	\$16,002
210038	University of Maryland Medical Center Midtown Campus	51.9%	56.4%	55.1%	53.1%	\$16,098	\$12,753
210039	Calvert Memorial Hospital	73.8%	74.9%	60.5%	60.1%	\$14,732	\$13,986
210040	Northwest Hospital	70.7%	73.8%	60.4%	60.0%	\$18,678	\$16,743
210043	University of Maryland Baltimore Washington Medical Center	76.2%	78.8%	59.3%	58.5%	\$18,026	\$16,286
210044	Greater Baltimore Medical Center	61.8%	63.6%	61.2%	60.9%	\$15,271	\$14,618
210045	McCready Hospital	44.7%	46.3%	65.7%	66.4%	\$10,257	\$10,195
210048	Howard County General Hospital	77.0%	80.1%	59.1%	58.8%	\$16,354	\$15,410
210049	University of Maryland Upper Chesapeake Medical Center	77.1%	79.9%	66.1%	65.7%	\$17,428	\$16,147
210051	Doctors' Community Hospital	62.8%	68.5%	58.5%	57.7%	\$20,695	\$18,615
210055	Laurel Regional Hospital	65.8%	65.2%	55.4%	57.3%	\$19,974	\$16,977
210056	MedStar Good Samaritan Hospital	66.3%	69.8%	62.3%	61.4%	\$20,890	\$18,252
210057	Adventist HealthCare Shady Grove Medical Center	76.2%	78.6%	57.9%	57.6%	\$17,949	\$17,220
210060	Fort Washington Medical Center	67.3%	67.3%	59.8%	59.1%	\$11,737	\$11,513
210061	Atlantic General Hospital	62.1%	63.6%	61.2%	60.8%	\$11,016	\$10,794
210062	MedStar Southern Maryland Hospital Center	70.2%	74.4%	58.1%	56.8%	\$22,065	\$19,803
210063	University of Maryland St. Joseph Medical Center	69.1%	71.6%	60.7%	60.5%	\$17,670	\$16,991
210064	Levindale Hebrew Geriatric Hospital	86.3%	85.1%	52.0%	51.0%	\$55,862	\$45,889
210065	Holy Cross Germantown Hospital	86.2%	84.3%	54.3%	55.5%	\$10,524	\$9,551

# MHA Attribution – More to Do

- Start by attributing ACO beneficiaries
- Evaluate how beneficiaries move in/out of categories from one year to the next, i.e., among hospitals, from hospital use to non-use, and whether the patterns are the same for high-utilizers as other beneficiaries
- Evaluate impact of multi-year base and measurement periods on stability of results
- Assess attribution of beneficiaries with no hospital spending e.g., by proportion of beneficiaries in each zip-code that use hospital services, physician utilization model, geographic proximity. How do the different approaches influence the denominator?
- Evaluate for potential shared accountability, e.g., Montgomery County hospitals and other overlapping markets

# MHA Exclusions

- Exclude beneficiary and all payments for very specialized and unusual cases. Criteria include high cost, few cases and few hospitals
  - Examples: solid organ transplants, severe burns, Ilizarov, significant trauma, certain oncology diagnoses, Medicaid REM diagnoses. High and low outliers (1<sup>st</sup> and 99<sup>th</sup> percentile TCOC payments)
- Exclude cases from attribution methodology, but include all payments once the beneficiary is attributed
  - All inpatient rehabilitation, and do not attribute beneficiaries to University of Maryland Rehabilitation and Orthopedic Institute
- Transfers – count only encounter at hospital that the beneficiary is transferred to (same day)
- Exclude as “noise” all diagnostic imaging cases
- Roll-up/discount outpatient therapies and other cycle billed encounters