Evaluation of the Accountable Care Organization Investment Model

AIM Impacts in the First Performance Year Appendices

August 2018

Prepared for:
David Nyweide
Contracting Officer Representative
Centers for Medicare & Medicaid Services
Center for Medicare and Medicaid Innovation
2810 Lord Baltimore Drive, Suite 130
Baltimore, MD 21244

Submitted by:
Abt Associates
6130 Executive Blvd.
Rockville, MD 20852

In Partnership with:
L&M Policy Research
Insight Policy Research
J. Michael McWilliams

Contract # HHSM-500-2014-00026I / T0004

Contents

Appendix 2A. AIM Application Scoring Criteria

Test 1	Maximum Points
Spend plan quality	8
Demonstration of financial need	2
Agree to two-sided risk[a]	2
Geographic ACO penetration	4
Rural location	4
Total	20
Test 2	**Maximum Points**
Spend plan quality	8
Demonstration of financial need	2
Agree to two-sided risk[a]	6
Demonstrated financial savings	2
Quality of care	2
Total	20

Source: "AIM-RFA.pdf"
[a] Two-sided risk indicates that an ACO is eligible to share in savings to Medicare but is also required to repay losses to Medicare if it exceeds a set threshold.

Appendix 2B. Data Sources

Data sources include program-specific data on providers participating in the Shared Savings Program and the beneficiaries assigned to them; Medicare enrollment and administrative claims data to identify beneficiary characteristics and determine beneficiary assignment; market-level data to describe the markets within which AIM ACOs are located and define comparison groups; and primary data collection through a non-AIM Shared Savings Program (SSP) survey and ACO and physician interviews.

Programmatic Data and Medicare Administrative Data

We used the following AIM and SSP programmatic data:

- *ACO Provider Research Identifiable File (RIF)*: CMS constructed ACO research files that contain lists of entities participating in SSP by TIN (practice-level identifier), national provider identifier (NPI) (individual practitioner-level identifier), and CMS certification number (CCN) (facility providers). These data were based upon the Medicare Provider Enrollment, Chain, and Ownership System (PECOS) and ACO participation lists. Provider RIF Files for 2013 through 2016 were available at the time of this report.
- *Master Data Management (MDM) Beneficiary Extract (Chronic Conditions Warehouse [CCW] Virtual Research Data Center [VRDC])*: This data source contains the programmatically assigned ACO beneficiaries. These data are updated frequently and contain both preliminary prospective assignment as well as final retrospective assignment for the AIM ACOs. We used the MDM Beneficiary Extract to assess the performance of our implementation of the assignment algorithm against the final list of retrospectively assigned beneficiaries.
- *Benchmark files*: This data source, made available through the financial reconciliation contractor, contains the programmatically assigned ACO beneficiaries needed to construct the three-year baseline for financial reconciliation.[1] We used these files to assess the performance of our implementation of the assignment algorithm for the evaluation's baseline years.
- *National eligible lists*: This data source, made available through the financial reconciliation contractor, provides the list of beneficiaries nationwide who are eligible for beneficiary assignment. This list was used to refine our comparison group of assignment-eligible beneficiaries residing in each AIM ACO's market.
- *Shared Savings Program ACO Public Use Files (SSP PUFs)*: These publicly available data sets contain ACO financial results as well as assigned beneficiary characteristics. We used the SSP PUFs to obtain performance on earned shared savings, funds received, and recoupment. We used the 2015 and 2016 SSP PUFs.

We used Medicare claims and enrollment data from the CCW VRDC to obtain beneficiary characteristics:

- *Master Beneficiary Summary File ([MBSF] CCW VRDC)*: This beneficiary summary file contains beneficiary characteristics such as demographic information, Medicaid dual eligibility status, and disability status. Importantly, this file was used to determine beneficiaries' residence. We used the MBSF from 2013 to 2016 for the analyses in this report.

[1] https://www.cms.gov/Medicare/Medicare-Fee-for-Service-Payment/sharedsavingsprogram/Downloads/Shared-Savings-Losses-Assignment-Spec-V4.pdf

- *Medicare Research Identifiable Files ([RIFs] CCW VRDC)*: Medicare claims data for 2013 through 2016 were used to conduct assignment of beneficiaries to AIM ACOs and generate comparison groups. We used 100 percent Carrier (Part B) and outpatient claims. Data were pulled in September 2017.
- *Hierarchical Condition Codes (HCC) Risk Scores (CCW VRDC)*: These files provide the HCC flags (a set of 70 condition flags) and computed risk scores generated for all Medicare beneficiaries and used by Medicare to risk adjust beneficiary payments to Medicare Advantage plans. The HCC file for a particular year represents condition flags and risk scores based on diagnoses from the prior year. At the time of this report, the most recent file available on the CCW is for 2015 (based on 2014 conditions). We used files from 2013 to 2015.
- *Chronic Conditions File (CCW VRDC)*: The CCW maintains a data set of indicators for whether Medicare beneficiaries had one of 27 chronic conditions. We used the indicators for END (i.e., within a given year) to compile the history of chronic conditions for each beneficiary. We used data from 2013 to 2016.
- *Cost and Use File (CCW VRDC)*: The CCW maintains yearly cost and utilization variables based on administrative claims data. The variables were used to calculate many of the claims-based performance measures (see **Chapter 2.2**). Data were available through 2016.

Market-level Data

Publicly available market-level data were used characterize ACOs' geographic locations:

- *RUCA Codes*: RUCA codes are ZIP-level codes used to measure the rurality of the market served by AIM ACOs. Data and information on RUCA code development are available from the University of North Dakota's Center for Rural Health.[2] The RUCA codes were based on 2010 Census work-commuting data, 2012 Census Bureau revised urban area definition based on 2010 Census data, and 2013 ZIP Codes. RUCA designations for older ZIP Codes were obtained from the University of Washington's Rural Health Research Center. These data are based on the 2000 Census and the 2004 ZIP Code information. To define ACOs' rurality, we mapped the RUCA codes at the ZIP Code level to the residence of AIM ACOs' assigned beneficiaries and determined the percentage of assigned beneficiaries residing in a location with a RUCA code equal to or greater than 4 on a scale of 1 to 10, with 10 indicating most rural.[3]
- *Health Professional Shortage Areas (HPSA)*: HPSAs refer to geographic areas that lack sufficient health care providers to meet the population's needs. The Health Resources and Services Administration (HRSA) designates HPSAs so that more resources can be made available to those areas. Designations are made for primary care, dental health, and mental health.[4] HPSA designations

[2] https://ruralhealth.und.edu/ruca Last accessed on July 5, 2017

[3] Specifically a RUCA score of four indicates an area that is a "Micropolitan area core: primary flow within an Urban Cluster of 10,000 to 49,999."

[4] https://www.cms.gov/Outreach-and-Education/Medicare-Learning-Network-MLN/MLNProducts/downloads/HPSAfctsht.pdf

are available at the ZIP Code level for every year between 2013 and 2017.[5] We mapped them to AIM markets to obtain the percentage of AIM ACOs' assigned beneficiaries that were located in a HPSA-designated area for each corresponding year.

- *Other market-level information*: We generated "favorability scores" for ACO formation using a methodology described in **Chapter 3** and **Appendix 3E**. These scores are drawn from a wide array of market data sources, such as the Area Health Resource File, Behavioral Risk Factor Surveillance System, and Optum data. These sources are described in **Appendix 3E**.

Primary Data Collection

This report draws from two types of primary data collection:

- *AIM ACO Interviews*: We have conducted three sets of interviews for the evaluation thus far—introductory and exit interviews with AIM ACO leadership and clinician interviews with a subset of practitioners. While this report does not focus on findings from these interviews, information and insights gleaned help to inform the analyses. In particular, **Chapter 6** examines the use of care management visits identified by interviewees as a key focus of ACOs.
- *Non-AIM SSP Web Survey*: In fall 2016, we fielded a Web survey of non-AIM SSP ACOs to enable comparison with AIM ACOs along key dimensions such as organizational structure, care management activities, IT use, and quality measurement. We used information fielded from this survey to compare non-AIM SSP spending with AIM spending obtained through AIM expense reports. The survey sample frame consisted of 132 non-AIM ACOs (62 ACOs beginning SSP in 2016 and 70 ACOs beginning SSP between 2013 and 2015). Overall, 48 of the 132 sampled non-AIM SSP ACOs (36.3 percent) completed the survey. See **Chapter 7** for some of the results from the survey.

[5] https://www.cms.gov/Medicare/Medicare-Fee-for-Service-Payment/HPSAPSAPhysicianBonuses/index.html?redirect=/hpsapsaphysicianbonuses/

Appendix 2C. Beneficiary Assignment to ACOs

Beneficiaries are assigned to AIM ACOs using the SSP retrospective beneficiary assignment algorithm. The algorithm is implemented by CMS through its financial reconciliation contractor. An important component of the evaluation is being able to replicate the SSP assignment algorithm accurately to define treatment, comparison, and baseline populations. In this appendix chapter, we describe the assignment methodology and report our success in replicating and applying the assignment algorithm.

SSP Beneficiary Assignment Algorithm

To be assignable to an ACO according to the SSP assignment algorithm, beneficiaries must meet the following criteria during the year of assignment:

- At least 1 month of Part A and Part B enrollment and no months of only Part A or only Part B enrollment;
- No months of Medicare Advantage (private payer) health plan enrollment;
- Not assigned to any other Medicare shared savings initiative; and
- Residence in the U.S. or U.S. territories and possessions based on the most recent available data regarding beneficiary residence at the end of the assignment window.

Between 2012 and 2015, beneficiaries who received at least one primary care service from a physician who is deemed an ACO professional were assigned to the ACO based on a two-step process:[6]

- Step 1: The first step assigns a beneficiary to an ACO if the beneficiary received at least one primary care service from a primary care physician participating in an ACO. Primary care physicians are defined as those with the following specialties: internal medicine, general practice, family practice, or geriatric medicine. Primary care services, as measured by allowed charges associated with a set of Healthcare Common Procedure Coding System codes and revenue center codes,[7] with primary care physicians are aggregated to all TINs or CCNs associated with each ACO.[8] The aggregate allowed charges from primary care physicians in an ACO are then compared with a beneficiary's primary care services from primary care physicians under each non-ACO TIN/CCN to determine whether the beneficiary obtained a plurality of primary care from ACO providers. If so, the beneficiary is assigned to the ACO.
- Step 2: Those beneficiaries who did not receive a primary care service from a primary care physician inside or outside of the ACO are assigned to an ACO as long as the plurality of primary care services (measured by associated allowed charges) is from qualifying specialist physicians (including non-

6 CMS, "Medicare Shared Savings Program: Shared Savings and Losses and Assignment Methodology Specification, Applicable beginning Performance Year 2015," Version 3, December 2014.

7 See Table 1 of the "Medicare Shared Savings Program: Shared Savings and Losses and Assignment Methodology Specification, Applicable beginning Performance Year 2015," Version 3, December 2014.

8 Primary care received from ACO providers that are RHCs, FQHCs, method II CAHs, and Electing Teaching Amendment (ETA) hospitals is also used in assignment. We identified these entities using CCNs.

primary care physicians, nurse practitioners, clinical nurse specialists, and physician assistants) under TINs participating in an ACO.[9]

Effective on January 1, 2016, updated assignment rules were applied.[10] Changes to the assignment methodology included:

- Step 1 expanded from considering primary care services from only primary care *physicians* to primary care *practitioners* (nurse practitioners, clinical nurse specialists, and physician assistants).
- Primary care physician specialties were expanded to include the pediatric specialty.
- Certain specialty types whose services are not likely to be indicative of primary care services were removed from Step 2 to place a greater emphasis on primary care.
- The definition of primary care services was expanded to include transitional care management services following a beneficiary's discharge from a hospital or a SNF and chronic care management services for beneficiaries with two or more chronic conditions. Specifically, these services include CPT codes: 99490, 99495, 99496, and a new code for outpatient hospital claims, G0463.

Effective January 1, 2017, the definition of primary care services excludes services delivered to beneficiaries in SNFs (CPT codes 99304 to 99318) for claims that contain the place of service (POS) 31 modifier.[11]

Applying the Assignment Algorithm

We had access to the MDM Beneficiary Extract and Benchmark files to identify the officially assigned beneficiaries in each year from 2013 to 2016 (see **Appendix 2B** for a description of these files). For Test 1 AIM ACOs, the MDM Beneficiary Extract allowed us to identify assigned beneficiaries in the 2016 performance year, their first year in AIM. The Benchmark files allowed us to identify the beneficiaries who would have been assigned to an ACO in 2013 through 2015 based on the providers participating in the ACO in 2016.[12] These beneficiaries were used to calculate the benchmark for determining shared savings for the ACO and represented the beneficiaries in the three-year baseline period for the evaluation.

---

9 For the list of physician specialties, see Table 3 of the "Medicare Shared Savings Program: Shared Savings and Losses and Assignment Methodology Specification, Applicable beginning Performance Year 2015," Version 3, December 2014.

10 CMS (79 FR 67802), "Medicare Program; Medicare Shared Savings Program: Accountable Care Organizations," June 9, 2015.

11 CMS (42 CFR Parts 405, 4010, 411, et al., "Medicare Program: Revisions to Payment Policies Under the Physician Fee Schedule and Other Revisions to Part B for CY 2016," November 16, 2015. Also see https://www.naacos.com/news/Criticalchangesin2016Medicarephysicianfeeschedule392016.htm accessed May 24, 2016

12 Five Test 1 AIM ACOs began SSP in 2015 (and AIM in 2016). We still hypothetically assigned beneficiaries to 2016 providers using 2015 claims data.

To evaluate Test 2 AIM ACOs, which existed in the Shared Savings Program prior to joining AIM, we applied the assignment algorithm to each performance year since starting the Shared Savings Program to create two baseline years preceding their first performance year in AIM.[13]

We were able to closely match the officially assigned beneficiaries. Overall, we were able to identify approximately 98 percent of officially assigned beneficiaries across AIM ACOs (see **Exhibit 2C-1**).[14] The small percentage of officially assigned beneficiaries who were not "Abt assigned" were because the beneficiary did not meet eligibility criteria; was assigned to another ACO; or was not assigned to any ACO. These discrepancies in assignment are likely from differences in the timing of the data sources used—Abt assignment was conducted with more claims run-out time than was available to the financial reconciliation contractor. Our application of the algorithm did yield a slightly greater number of assigned beneficiaries than the official lists. Across AIM ACOs, Abt assigned, on average, 4 to 5 percent more beneficiaries than the number of Abt beneficiaries matching the official list of beneficiaries (last column of **Exhibit 2C-1**). The percentage of overlap for each ACO that participated in AIM is provided in **Exhibit 2C-2**.

Exhibit 2B-1. Comparing Official and Abt-Assigned Beneficiary Counts across AIM ACOs (2013-2016)

Year	# of AIM ACOs [a]	Total # Official Beneficiaries	# Abt Beneficiaries	% Overlap	# Abt Additional	% Abt Additional
2013	45	405,576	398,535	98.3%	18,758	4.7%
2014	47	438,542	429,914	98.0%	19,221	4.5%
2015	47	445,589	435,412	97.7%	20,447	4.7%
2016	45	421,562	412,750	97.9%	16,890	4.1%

Source: MDD_BENE_EXTRACT_LINKED_170911, Benchmark files from 2013 to 2015 received from CMS in May 2017.
[a] Two Test 2 AIM ACOs were not present in 2016 because they existed the Shared Savings Program at the end of 2015. Two additional Test 2 AIM ACOs were not present in 2013 because they began the Shared Savings Program in 2014. For Test 2 AIM ACOs, actual SSP assignment was used to define the AIM baseline. In contrast, for Test 1 AIM ACOs, we compared Abt's hypothetical assignment to the Benchmark files for 2013 through 2015 (the baseline years for Test 1 AIM ACOs).

The Abt beneficiaries overlapping with the official lists were designated as treatment beneficiaries—or beneficiaries exposed to the intervention of being in an AIM ACO—for the purposes of this evaluation. Thus, both Abt additional beneficiaries and officially assigned beneficiaries not assigned by Abt were excluded from the treatment group. If they met the comparison group criteria (see **Chapter 2.2**), Abt additional beneficiaries may have appeared in the market comparison group; however, officially assigned beneficiaries that were not identified by Abt were excluded from both treatment and comparison groups.

[13] The exception was the Physicians Collaborative Trust of Mississippi Gulf Coast, which started SSP in 2012. For this ACO, we applied the assignment algorithm starting in 2013.

[14] For 43 AIM ACOs, the first AIM performance year was 2016. For four AIM ACOs, the first AIM performance year was 2015 (**Chapter 3** provides more detail on SSP and AIM start dates for each AIM ACO).

Exhibit 2C-2: Abt Replication of Beneficiary Assignment

AIM ACO Name	2016			2015			2014			2013		
	SSP	Abt	Abt Additional	SSP	Abt	Abt Additional	SSP	Abt	Abt Additional	SSP	Abt	Abt Additional
Physicians Collaborative Trust of Mississippi Gulf Coast	-	-	-	5,137	5,046	50	5,548	5,402	49	5,236	5,179	31
Baroma Healthcare International.	-	-	-	6,090	5,955	102	6,968	6,854	111	4,946	4,900	90
The Premier Healthcare Network	8,102	7,978	47	5,411	5,379	63	4,544	4,525	40	5,072	5,048	62
Akira Health	7,672	7,592	48	8,039	7,977	107	8,906	8,839	85	3,946	3,907	47
Sunshine ACO	5,015	4,954	43	4,602	4,548	26	5,837	5,773	28	-	-	-
PremierMD ACO	5,263	5,205	215	8,856	8,697	304	6,507	6,451	134	-	-	-
Carolina Medical Home Network ACO	12,769	12,647	795	13,780	13,655	1,306	13,499	13,422	1,415	13,506	13,418	1,125
Illinois Rural Community Care Organization	20,716	19,676	1,207	21,305	19,534	1,324	20,187	19,219	1,136	20,168	19,476	1,025
Reid ACO	9,107	8,967	123	7,881	7,735	565	7,430	7,310	729	7,211	7,126	304
Akira Health of Los Angeles	5,484	5,379	87	4,980	4,899	95	4,651	4,588	163	4,437	4,380	164
American Rural ACO	6,826	6,371	179	6,918	6,708	237	6,375	6,176	182	5,495	5,365	267
Access Care Oklahoma	7,536	7,430	285	8,070	7,943	285	9,318	9,149	227	9,013	8,880	239
Citrus County ACO	9,427	9,352	387	8,856	8,791	458	8,337	8,274	472	7,937	7,878	539
AmpliPHY of Texas ACO	7,314	7,276	98	7,348	7,291	85	7,267	7,200	206	6,515	6,494	374
AmpliPHY of Kentucky ACO	6,907	6,775	162	7,819	7,721	210	7,978	7,882	207	8,482	8,387	184
National Rural ACO 3	6,354	6,261	201	6,834	6,688	229	5,739	5,656	207	5,281	5,213	467
Avera ACO	10,137	10,040	179	9,787	9,642	685	9,369	9,303	224	9,055	8,986	163
Avera ACO II	9,651	9,525	318	7,367	7,220	308	6,054	5,967	287	6,100	6,044	480
National Rural ACO 6	13,115	12,807	1,078	13,401	13,097	1,138	12,509	12,193	1,060	11,758	11,398	972
Iowa Rural ACO	11,208	11,010	368	11,417	11,223	435	11,351	11,131	396	10,941	10,757	506
Illinois Rural ACO	13,745	13,568	614	13,367	13,225	375	13,303	13,145	290	14,350	14,198	415
Indiana Rural ACO II	5,360	5,324	194	5,355	5,325	236	5,127	5,091	149	5,209	5,176	74
Indiana Rural ACO	13,534	13,348	885	14,672	14,536	1,034	15,577	15,388	554	15,428	15,239	534
Michigan Rural ACO	11,317	10,991	672	12,196	11,896	594	11,818	11,613	541	11,864	11,674	484
Michigan Rural ACO II	9,536	9,435	242	9,456	9,339	325	9,141	9,022	358	8,469	8,335	257
New Hampshire Rural ACO	11,627	11,485	773	12,106	12,019	699	11,918	11,848	609	11,058	10,983	702
National Rural ACO 14	14,738	14,557	265	13,324	13,106	289	12,230	12,066	300	10,095	10,017	210
National Rural ACO 16	12,293	11,594	1,047	12,920	12,264	1,024	12,899	12,262	941	13,497	12,993	910
North Mississippi ACO	18,432	18,178	68	19,872	19,203	97	23,406	22,728	132	22,922	22,471	128
National Rural ACO 20	7,109	6,858	375	8,447	8,098	399	7,569	7,316	567	6,998	6,818	625

AIM ACO Name	2016			2015			2014			2013		
	SSP	Abt	Abt Additional	SSP	Abt	Abt Additional	SSP	Abt	Abt Additional	SSP	Abt	Abt Additional
Minnesota Rural ACO	5,008	4,955	81	5,254	5,206	99	5,567	5,485	81	5,820	5,699	101
National Rural ACO 22	8,279	8,069	201	8,586	8,226	310	8,914	8,716	354	8,611	8,473	514
National Rural ACO 23	11,501	11,118	994	11,518	11,044	1,039	10,371	9,878	927	9,153	8,602	962
National Rural ACO 24	8,535	8,170	277	8,469	8,167	268	8,009	7,769	259	7,617	7,462	385
Aledade Kansas ACO	8,824	8,743	119	6,946	6,889	686	6,540	6,470	692	6,243	6,195	643
Aledade West Virginia ACO	7,579	7,484	34	7,655	7,536	26	7,567	7,455	36	7,420	7,370	38
Heartland Physicians ACO	6,173	6,088	166	8,768	8,653	91	8,408	8,333	103	8,159	8,101	112
Alliance ACO	7,408	7,366	117	8,082	8,018	143	7,982	7,921	173	8,105	8,053	174
Kentucky Primary Care Alliance	4,486	4,362	534	5,005	4,895	710	4,875	4,741	743	4,756	4,645	712
Aledade Mississippi ACO	13,250	13,067	129	18,472	18,151	189	21,329	20,986	196	21,799	21,476	135
Tar River Health Alliance	8,842	8,691	21	8,557	8,426	59	8,558	8,432	52	9,559	9,444	63
Affiliated ACO	5,805	5,720	75	6,278	6,206	61	6,646	6,574	60	6,925	6,854	89
California ACO	10,701	10,362	114	11,360	11,018	146	10,048	9,725	139	9,532	9,253	156
San Juan Accountable Care Organization	7,387	7,341	546	7,429	7,391	589	6,797	6,755	470	5,450	5,426	566
Rocky Mountain Accountable Care Organization	13,540	13,300	1,554	13,331	13,112	1,776	11,587	11,348	1,792	8,961	8,768	1,398
MissouriHealth+	7,418	7,032	566	7,673	7,323	809	7,500	7,259	974	6,204	5,995	977
Beacon Rural Health	6,532	6,299	407	6,593	6,391	362	6,482	6,274	371	6,273	5,979	355
Total	421,562	412,750	16,890	445,589	435,412	20,447	438,542	429,914	19,221	405,576	398,535	18,758

Sources: MDD_BENE_EXTRACT_LINKED_170911, Benchmark files from 2013 to 2015 received from CMS in May 2017.

Appendix 2D. AIM ACO Impact Evaluation Years and Comparison Groups

ACO Name	SSP Start Date	AIM Start Date	AIM Test 1 or 2	Baseline Years	Baseline Year Assignment Method [c]	Performance Years to be Evaluated [d]	Comparison Group(s) [e]
Test 2 AIM ACOs							
Physicians Collaborative Trust of Mississippi Gulf Coast [a]	Apr-12	Apr-15	2	2013, 2014	Actual SSP	2015	Non-AIM SSP ACOs
Baroma Healthcare International [a]	Jan-13	Apr-15	2	2013, 2014	Actual SSP	2015	Non-AIM SSP ACOs
The Premier Healthcare Network	Jan-13	Apr-15	2	2013, 2014	Actual SSP	2015, 2016, 2017, 2018	Non-AIM SSP ACOs
Akira Health	Jan-13	Apr-15	2	2013, 2014	Actual SSP	2015, 2016, 2017, 2018	Non-AIM SSP ACOs
Sunshine ACO	Jan-14	Jan-16	2	2014, 2015	Actual SSP	2016, 2017, 2018	Non-AIM SSP ACOs
PremierMD ACO	Jan-14	Jan-16	2	2014, 2015	Actual SSP	2016, 2017, 2018	Non-AIM SSP ACOs
Test 1 AIM ACOs							
Carolina Medical Home Network ACO	Jan-15	Jan-16	1	2013, 2014 [b]	PY providers	2016, 2017, 2018	ACO Market FFS
Illinois Rural Community Care Organization	Jan-15	Jan-16	1	2013, 2014 [b]	PY providers	2016, 2017, 2018	ACO Market FFS
Reid ACO	Jan-15	Jan-16	1	2013, 2014 [b]	PY providers	2016, 2017, 2018	ACO Market FFS
Akira Health of Los Angeles	Jan-15	Jan-16	1	2013, 2014 [b]	PY providers	2016, 2017, 2018	ACO Market FFS
American Rural ACO	Jan-15	Jan-16	1	2013, 2014 [b]	PY providers	2016, 2017, 2018	ACO Market FFS
Access Care Oklahoma	Jan-16	Jan-16	1	2013, 2014, 2015	PY providers	2016, 2017, 2018	ACO Market FFS
Citrus County ACO	Jan-16	Jan-16	1	2013, 2014, 2015	PY providers	2016, 2017, 2018	ACO Market FFS
AmpliPHY of Texas ACO	Jan-16	Jan-16	1	2013, 2014, 2015	PY providers	2016, 2017, 2018	ACO Market FFS
AmpliPHY of Kentucky ACO	Jan-16	Jan-16	1	2013, 2014, 2015	PY providers	2016, 2017, 2018	ACO Market FFS
National Rural ACO 3	Jan-16	Jan-16	1	2013, 2014, 2015	PY providers	2016, 2017, 2018	ACO Market FFS
Avera ACO	Jan-16	Jan-16	1	2013, 2014, 2015	PY providers	2016, 2017, 2018	ACO Market FFS
Avera ACO II	Jan-16	Jan-16	1	2013, 2014, 2015	PY providers	2016, 2017, 2018	ACO Market FFS
National Rural ACO 6	Jan-16	Jan-16	1	2013, 2014, 2015	PY providers	2016, 2017, 2018	ACO Market FFS
Iowa Rural ACO	Jan-16	Jan-16	1	2013, 2014, 2015	PY providers	2016, 2017, 2018	ACO Market FFS
Illinois Rural ACO	Jan-16	Jan-16	1	2013, 2014, 2015	PY providers	2016, 2017, 2018	ACO Market FFS
Indiana Rural ACO II	Jan-16	Jan-16	1	2013, 2014, 2015	PY providers	2016, 2017, 2018	ACO Market FFS
Indiana Rural ACO	Jan-16	Jan-16	1	2013, 2014, 2015	PY providers	2016, 2017, 2018	ACO Market FFS
Michigan Rural ACO	Jan-16	Jan-16	1	2013, 2014, 2015	PY providers	2016, 2017, 2018	ACO Market FFS
Michigan Rural ACO II	Jan-16	Jan-16	1	2013, 2014, 2015	PY providers	2016, 2017, 2018	ACO Market FFS
New Hampshire Rural ACO	Jan-16	Jan-16	1	2013, 2014, 2015	PY providers	2016, 2017, 2018	ACO Market FFS

ACO Name	SSP Start Date	AIM Start Date	AIM Test 1 or 2	Baseline Years	Baseline Year Assignment Method [c]	Performance Years to be Evaluated [d]	Comparison Group(s) [e]
National Rural ACO 14	Jan-16	Jan-16	1	2013, 2014, 2015	PY providers	2016, 2017, 2018	ACO Market FFS
National Rural ACO 16	Jan-16	Jan-16	1	2013, 2014, 2015	PY providers	2016, 2017, 2018	ACO Market FFS
North Mississippi ACO	Jan-16	Jan-16	1	2013, 2014, 2015	PY providers	2016, 2017, 2018	ACO Market FFS
National Rural ACO 20	Jan-16	Jan-16	1	2013, 2014, 2015	PY providers	2016, 2017, 2018	ACO Market FFS
Minnesota Rural ACO	Jan-16	Jan-16	1	2013, 2014, 2015	PY providers	2016, 2017, 2018	ACO Market FFS
National Rural ACO 22	Jan-16	Jan-16	1	2013, 2014, 2015	PY providers	2016, 2017, 2018	ACO Market FFS
National Rural ACO 23	Jan-16	Jan-16	1	2013, 2014, 2015	PY providers	2016, 2017, 2018	ACO Market FFS
National Rural ACO 24	Jan-16	Jan-16	1	2013, 2014, 2015	PY providers	2016, 2017, 2018	ACO Market FFS
Aledade Kansas ACO	Jan-16	Jan-16	1	2013, 2014, 2015	PY providers	2016, 2017, 2018	ACO Market FFS
Aledade West Virginia ACO	Jan-16	Jan-16	1	2013, 2014, 2015	PY providers	2016, 2017, 2018	ACO Market FFS
Heartland Physicians ACO	Jan-16	Jan-16	1	2013, 2014, 2015	PY providers	2016, 2017, 2018	ACO Market FFS
Alliance ACO	Jan-16	Jan-16	1	2013, 2014, 2015	PY providers	2016, 2017, 2018	ACO Market FFS
Kentucky Primary Care Alliance	Jan-16	Jan-16	1	2013, 2014, 2015	PY providers	2016, 2017, 2018	ACO Market FFS
Aledade Mississippi ACO	Jan-16	Jan-16	1	2013, 2014, 2015	PY providers	2016, 2017, 2018	ACO Market FFS
Tar River Health Alliance	Jan-16	Jan-16	1	2013, 2014, 2015	PY providers	2016, 2017, 2018	ACO Market FFS
Affiliated ACO	Jan-16	Jan-16	1	2013, 2014, 2015	PY providers	2016, 2017, 2018	ACO Market FFS
California ACO	Jan-16	Jan-16	1	2013, 2014, 2015	PY providers	2016, 2017, 2018	ACO Market FFS
San Juan Accountable Care Organization	Jan-16	Jan-16	1	2013, 2014, 2015	PY providers	2016, 2017, 2018	ACO Market FFS
Rocky Mountain Accountable Care Organization	Jan-16	Jan-16	1	2013, 2014, 2015	PY providers	2016, 2017, 2018	ACO Market FFS
MissouriHealth+	Jan-16	Jan-16	1	2013, 2014, 2015	PY providers	2016, 2017, 2018	ACO Market FFS
Beacon Rural Health	Jan-16	Jan-16	1	2013, 2014, 2015	PY providers	2016, 2017, 2018	ACO Market FFS

[a] ACO exited the Medicare Shared Savings Program at the end of 2015.
[b] Further discussion needed to determine whether 2015 will be included or excluded from the baseline period in future analyses.
[c] "Actual SSP" assignment is the assignment methodology used to determine the financial results each year, which is based on the providers participating in the ACO in each year. "Based on PY providers" is determined using providers participating in the ACO for a particular performance year and applying the beneficiary assignment rules using those providers to the baseline years.
[d] Performance years listed cover the entire scope of the evaluation. For this report, we examine only performance year 1 (2015 or 2016, depending on the ACO). Also note that AIM funding ends after two years in AIM (March 31, 2017 for those starting AIM in April 2015 and December 31, 2017 for those starting AIM in January 2016).
[e] The non-AIM SSP ACO comparison group consists of SSP ACOs in the same cohort (SSP start date, financial risk track, and approximate assigned beneficiary size) as the AIM ACO. We excluded any SSP ACOs previously participating in the Advanced Payment ACO Model. Depending on the performance measure, we examined aggregate ACO-level outcomes or assigned beneficiary-level outcomes. The ACO market FFS comparison group consists of fee-for-service beneficiaries eligible for ACO assignment residing in the same Primary Care Service Areas (PCSAs) as assigned beneficiaries. ACO markets are defined separately for each AIM ACO. The ACO market FFS comparison group is only used for claims-based performance measures.

Appendix 2E. AIM Evaluation Performance Measures

Measure	Description
Cost and Utilization	
Medicare Payments (per beneficiary per month)	
Total payment	Total Medicare Payments (Parts A and B, includes Per Diem Payment for Acute & OIP)
Acute inpatient	Acute Medicare Payment + Acute Per Diem Payment Acute Medicare Payment is the sum of the Medicare claim payment amounts (claim payment amount from each claim) in the acute inpatient setting for a given year. Acute Per Diem Payment is the sum of the entire pass through per diem payment amounts (Claim pass through per diem amount from each claim) in the acute inpatient setting for a given year. Medicare payments are designed to include certain "pass-through" expenses such as capital-related costs, direct medical education costs, kidney acquisition costs for hospitals that are renal transplant centers, and bad debts. This variable is the sum of all the daily payments for pass-through expenses. It is not included in the Medicare Payment amount (Acute Medicare Payment). To determine the total Medicare payments for acute hospitalizations for the beneficiary, this field should be added to the total Medicare payment amount for acute hospitalizations.
Physician services	Anesthesia + E&M + imaging + procedures + physician visits (E&M in office setting) + tests + part B drugs Procedures is the total Medicare payments for services considered part B other procedures (i.e., not anesthesia or dialysis) for a given year. Claims for other procedures are a subset of the claims, and a subset of procedures in the Part B Carrier data file. These other procedure claims are defined as those with a line BETOS code where the first 2 digits are ('P1','P2','P3','P4','P5','P6','P7', or 'P8'). Anesthesia is the total Medicare payments for part B anesthesia services for a given year. Anesthesia claims are a subset of the claims, and a subset of procedures in the Part B Carrier data file. Anesthesia claims are defined as those with a line BETOS code where the first 2 digits = "P0" and the units for the carrier line='2'. E&M is the total Medicare payments for the part B evaluation and management services for a given year. E & M claims are a subset of the claims in the Part B Carrier and DME data files, and a subset of physician claims. The E & M claims are defined as those with a line BETOS code where the first digit ='M', but is not M1A or M1B, which are categorized as physician office care in this file. Imaging is the total Medicare payments for imaging services for a given year. Claims for imaging procedures are a subset of the claims, and a subset of procedures in the Part B Carrier and DME data files. These imaging claims are defined as those with a line BETOS code (BETOS_CD) where the first digit =I (except for 'I1E', or 'I1F' – which are considered Part B drugs). Physician visits (E&M in office setting) is the total Medicare payments for the part B physician office services for a given year. Physician office claims are a subset of the claims in the Part B Carrier and DME data files, and a subset of physician evaluation and management claims (note that E&M are tabulated separately in this data file). The physician visit claims are defined as those with a line BETOS code where the first three digits =M1A or M1B (the remainder of physician services which occur in different settings appear in E & M) Tests is the total Medicare payments for part B tests for a given year. Claims for tests are a subset of the claims in the Part B Carrier data file. These claims are defined as those with a line BETOS code where the first digit =T. Part B drugs is the total Medicare payments for Part B drugs for a given year. Part B drug claims are a subset of the claims in the Part B Carrier and DME data files. The Part B drug claims are identified by BETOS codes with values of 'D1G','O1D','O1E','O1G','I1E', or 'I1F'.

Measure	Description
Hospital outpatient + ambulatory surgery centers	Hospital outpatient is the total Medicare payments in the hospital outpatient setting for a given year. Calculated as the sum of CLM_PMT_AMT for all HOP claims where the CLM_PMT_AMT >= 0. Ambulatory surgery center is the total Medicare payments in the part B ambulatory surgery center (ASC) setting for a given year. ASC claims are a subset of the claims in the Part B Carrier data file. The ASC claims are identified by the claim lines where the HCFA type service code = 'F'. The total ASC Medicare Payments are calculated as the sum of NCH payment amount where the processing indicator code was ('A','R', or 'S').
SNF	This variable is the total Medicare payments in the skilled nursing facility (SNF) setting for a given year. The total Medicare payments for SNF are calculated as the sum of non-negative claim payment amounts for all SNF claims.
Home health	This variable is the total Medicare payments in the home health (HH) setting for a given year. Calculated as the sum of non-negative claim payment amounts for all HH claims.
DME	Total Medicare payments for part B durable medical equipment (DME) for a given year. Claims for DME are a subset of the claims in the Part B Carrier and DME data files. These claims are defined as those with a line BETOS code where the first three digits are ('D1A','D1B','D1C','D1D','D1E', or 'D1F').
Inpatient utilization	
Inpatient stays	This variable is the count of acute inpatient hospital stays (unique admissions, which may span more than one facility) for the year. An acute inpatient stay is defined as a set of one or more consecutive acute inpatient hospital claims where the beneficiary is only discharged on the most recent claim in the set. If a beneficiary is transferred to a different provider, the acute stay is continued even if there is a discharge date on the claim from which the beneficiary was transferred.
Any inpatient hospitalization	Indicator = 1 if inpatient stays > 0; 0 otherwise
All-cause 30-day readmission	Indicator = 1 for hospital readmission within 30 days of hospital discharge for beneficiaries that were hospitalized; 0 otherwise
Any ASC admission	Indicator = 1 for any of the following 13 non-pediatric ambulatory care sensitive conditions: 1. Bacterial pneumonia, 2. Hypertension, 3. Dehydration, 4. Adult asthma, 5. Urinary tract infection, 6. Chronic obstructive pulmonary disease (COPD), 7. Perforated appendix, 8. Diabetes short-term complication, 9. Diabetes long-term complication, 10. Angina without procedure, 11. Uncontrolled diabetes, 12. Congestive heart failure (CHF), 13. Lower-extremity amputation among patients with diabetes; 0 otherwise (see AHRQ, AHRQ Quality Indicators, "Guide to Prevention Quality Indicators: Hospital Admission for Ambulatory Care Sensitive Conditions," October 2001).
Emergency department and observation utilization	
Any ED visits, no hospital admission	Indicator = 1 if the count of unique emergency department revenue center dates (as a proxy for an ED visit) in the hospital outpatient data file for the year is greater than zero. Revenue center codes indicating Emergency Room use were (0450, 0451, 0452, 0456, or 0459).
Any ED visits with hospital admission	Indicator = 1 if the count of emergency department (ED) claims in the inpatient setting for the year is greater than zero. The revenue center codes indicating Emergency Room use were (0450, 0451, 0452, 0456, 0459).
Outpatient observation stays	Count of observation stays including those that did and did not result in an inpatient admission. The observation stays that resulted in admission, and are included in the inpatient claim, are identified with revenue center code 0762 in the Inpatient claim file. Medicare-paid observation stays that do not result in an inpatient admission will be found in the Medicare Outpatient file using revenue center code 0762.

Measure	Description
Post-acute care and hospice utilization	
SNF days	Count of Medicare covered days in the skilled nursing facility (SNF) setting for the year. This variable equals the sum of the CLM_UTLZTN_DAY_CNT variables on the source claims.
Any hospice use	Indicator = 1 if any hospice spending in the year.
Physician services utilization	
Physician services: office-based E&M visits	Physician office E&M is the count of events in the Part B physician office services (PHYS) for a given year. An event is defined as each line item that contains the relevant service. Physician office claims are a subset of the claims in the Part B Carrier and DME data files, and a subset of physician evaluation and management claims (note that E&M are tabulated separately in this data file). The PHYS claims are defined as those with a line BETOS code where the first three digits =M1A or M1B (the remainder of physician services which occur in different settings appear in E&M).
Physician services: BETOS imaging	Count of events for imaging services (IMG) for a given year. An event is defined as each line item that contains the relevant service. Claims for imaging procedures are a subset of the claims, and a subset of procedures in the Part B Carrier and DME data files. These imaging claims are defined as those with a line BETOS code where the first digit =I (except for 'I1E', or 'I1F' – which are considered Part B drugs).
Physician services: BETOS procedures	Count of events for Part B other procedures for a given year. An event is defined as each line item that contains the relevant service. Claims for other procedures are a subset of the claims in the Part B Carrier data file. These other procedure claims are defined as those with a line BETOS code where the first 2 digits are ('P1','P2','P3','P4','P5','P6','P7', or 'P8')
Physician services: BETOS tests	Count of events in for Part B tests for a given year. An event is defined as each line item that contains the relevant service. Claims for tests are a subset of the claims in the Part B Carrier data file. These claims are defined as those with a line BETOS code where the first digit =T.
Mortality	
Mortality	Indicator =1 for death in the year; 0 otherwise
Quality and Outcome Measures	
Patient/Caregiver Experience (CAHPS)	
Getting Timely Care, Appointments, and Information (ACO #1)	CAHPS survey measure, composite of responses to: In the last 6 months, when you phoned this provider's office to get an appointment for care you needed right away, how often did you get an appointment as soon as you needed? In the last 6 months, when you made an appointment for a check-up or routine care with this provider, how often did you get an appointment as soon as you needed? In the last 6 months, when you phoned this provider's office during regular office hours, how often did you get an answer to your medical question that same day? In the last 6 months, when you phoned this provider's office after regular office hours, how often did you get an answer to your medical question as soon as you needed? In the last 6 months, how often did you see this provider within 15 minutes of your appointment time?
How Well Your Doctors Communicate (ACO #2)	CAHPS survey measure, composite of responses to: In the last 6 months, how often did this provider explain things in a way that was easy to understand? In the last 6 months, how often did this provider listen carefully to you? In the last 6 months, how often did this provider give you easy to understand information about these health questions or concerns? In the last 6 months, how often did this provider seem to know the important information about your medical history? In the last 6 months, how often did this provider show respect for what you had to say? In the last 6 months, how often did this provider spend enough time with you?

Measure	Description
Patients' Rating of Doctor (ACO #3)	Using any number from 0 to 10, where 0 is the worst provider possible and 10 is the best provider possible, what number would you use to rate this provider?
Access to Specialists (ACO #4)	CAHPS survey measure, composite of responses to: In the last 6 months, how often was it easy to get appointments with specialists? In the last 6 months, how often did the specialist you saw most seem to know the important information about your medical history?
Health Promotion and Education (ACO #5)	CAHPS survey measure, composite of responses to: Your health care team includes all the doctors, nurses and other people you see for health care. In the last 6 months, did you and anyone on your health care team talk about specific things you could do to prevent illness? In the last 6 months, did you and anyone on your health care team talk about a healthy diet and healthy eating habits? In the last 6 months, did you and anyone on your health care team talk about the exercise or physical activity you get? In the last 6 months, did anyone on your health care team talk with you about specific goals for your health? In the last 6 months, did anyone on your health care team ask you if there was a period of time when you felt sad, empty, or depressed? In the last 6 months, did you and anyone on your health care team talk about things in your life that worry you or cause you stress?
Shared Decision Making (ACO #6)	CAHPS survey measure, composite of responses to: Did you and this provider talk about the reasons you might want to take a medicine? Did you and this provider talk about the reasons you might not want to take a medicine? When you and this provider talked about starting or stopping a prescription medicine, did this provider ask what you thought was best for you? Did you and this provider talk about the reasons you might want to have the surgery or procedure? Did you and this provider talk about the reasons you might not want to have the surgery or procedure? When you and this provider talked about having surgery or a procedure, did this provider ask what you thought was best for you? In the last 6 months, did you and this provider talk about how much of your personal health information you wanted shared with your family or friends? In the last 6 months, did this provider respect your wishes about how much of your personal health information to share with your family or friends?
Health Status/Functional Status (ACO #7)	CAHPS survey measure, composite of responses to: In general, how would you rate your overall health? In general, how would you rate your overall mental or emotional health? Because of a physical, mental, or emotional condition, do you have serious difficulty concentrating, remembering, or making decisions? Is this a condition or problem that has lasted for at least 3 months? Is this medicine to treat a condition that has lasted for at least 3 months? During the last 4 weeks, how much of the time did your physical health interfere with your social activities (like visiting with friends, relatives, etc.)? Do you have serious difficulty walking or climbing stairs? Do you have difficulty dressing or bathing? Because of a physical, mental, or emotional condition, do you have difficulty doing errands alone such as visiting a doctor's office or shopping?

Measure	Description
Preventive Health	
Depression screening (ACO #18)	GPRO Web Interface reported measure; Full measure name: Preventive Care and Screening: Screening for Clinical Depression and Follow-Up Plan – National Quality Strategy Domain: Community/Population Health; Percentage of patients aged 12 years and older screened for clinical depression on the date of the encounter using an age appropriate standardized depression screening tool AND if positive, a follow-up plan is documented on the date of the positive screen
Colorectal cancer screening (ACO #19)	GPRO Web Interface reported measure; Percentage of patients 50-75 years of age who had appropriate screening for colorectal cancer
Mammography screening (ACO #20)	GPRO Web Interface reported measure
At-risk populations	
Diabetes poor control (ACO#27)	GPRO Web Interface reported measure; Full measure name: Diabetes: Hemoglobin A1c Poor Control – National Quality Strategy Domain: Effective Clinical Care; Percentage of patients 18-75 years of age with diabetes who had hemoglobin A1c > 9.0% during the measurement period
Hypertension (blood pressure control) (ACO #28)	GPRO Web Interface reported measure; Percentage of patients 18 through 85 years of age who had a diagnosis of hypertension and whose blood pressure was adequately controlled (< 140/90 mmHg) during the measurement period
Ischemic vascular disease control (ACO#30)	GPRO Web Interface reported measure; Full measure name is: Ischemic Vascular Disease (IVD): Use of Aspirin or Another Antithrombotic – National Quality Strategy Domain: Effective Clinical Care; Percentage of patients 18 years of age and older who were discharged alive for acute myocardial infarction (AMI), coronary artery bypass graft (CABG) or percutaneous coronary interventions (PCI) in the 12 months prior to the measurement period, or who had an active diagnosis of ischemic vascular disease (IVD) during the measurement period, and who had documentation of use of aspirin or another antithrombotic during the measurement period
Heart failure: beta blocker therapy (ACO#31)	GPRO Web Interface reported measure; Full measure name is: Heart Failure (HF): Beta-Blocker Therapy for Left Ventricular Systolic Dysfunction (LVSD) – National Quality Strategy Domain: Effective Clinical Care; Percentage of patients aged 18 years and older with a diagnosis of heart failure (HF) with a current or prior left ventricular ejection fraction (LVEF) < 40% who were prescribed beta-blocker therapy either within a 12 month period when seen in the outpatient setting OR at each hospital discharge
Coronary artery disease (ACO#33)	GPRO Web Interface reported measure; Full measure name is: Coronary Artery Disease (CAD): Angiotensin-Converting Enzyme (ACE) Inhibitor or Angiotensin Receptor Blocker (ARB) Therapy - Diabetes or Left Ventricular Systolic Dysfunction (LVEF < 40%); Percentage of patients aged 18 years and older with a diagnosis of coronary artery disease seen within a 12 month period who also have diabetes OR a current or prior Left Ventricular Ejection Fraction (LVEF) < 40% who were prescribed ACE inhibitor or ARB therapy
Depression remission at 12 months (ACO #40)	GPRO Web Interface reported measure; Adult patients age 18 and older with major depression or dysthymia and an initial PHQ-9 score > 9 who demonstrate remission at twelve months defined as PHQ-9 score less than 5. This measure applies to both patients with newly diagnosed and existing depression whose current PHQ-9 score indicates a need for treatment

Sources: Chronic Condition Data Warehouse, Master Beneficiary Summary File Cost & Use Segment Codebook, May 2017, Version 1.0; Accountable Care Organization 2015-2017 Quality Measure Narrative Specifications.

Appendix 3A. AIM ACO and Provider Characteristics in First Performance Year

ACO Name	AIM Start Date	SSP Start Year	Formation Type	# Practices (TINS)	# Facility-Based Participants	# Practitioners (TIN-NPIs) [a]	Percent Primary Care Practitioners	Percent Non-Physician Practitioners	Only Physician Practices?
Test 1 AIM ACOs									
Carolina Medical Home Network ACO	Jan-16	2015	Independent	6	6	276	65.6%	20.3%	No
Illinois Rural Community Care Organization	Jan-16	2015	Implementer	39	24	940	26.5%	9.9%	No
Reid ACO	Jan-16	2015	Primary Contact	3	3	208	23.6%	23.6%	No
Akira Health of Los Angeles	Jan-16	2015	Primary Contact	31	0	95	51.6%	28.4%	Yes
American Rural ACO	Jan-16	2015	Primary Contact	24	6	153	47.7%	12.4%	No
Access Care Oklahoma	Jan-16	2016	Independent	26	11	233	20.2%	15.5%	No
Citrus County ACO	Jan-16	2016	Implementer	23	2	42	47.6%	31.0%	No
AmpliPHY of Texas ACO	Jan-16	2016	Primary Contact	32	2	74	51.4%	14.9%	No
AmpliPHY of Kentucky ACO	Jan-16	2016	Primary Contact	8	0	35	51.4%	25.7%	Yes
National Rural ACO 3	Jan-16	2016	Primary Contact	17	10	213	32.9%	17.4%	No
Avera ACO	Jan-16	2016	Supplement	5	5	394	33.0%	13.5%	No
Avera ACO II	Jan-16	2016	Supplement	5	5	198	36.4%	10.6%	No
National Rural ACO 6	Jan-16	2016	Primary Contact	19	13	378	39.9%	13.2%	No
Iowa Rural ACO	Jan-16	2016	Primary Contact	7	7	346	36.4%	13.0%	No
Illinois Rural ACO	Jan-16	2016	Primary Contact	10	5	343	40.5%	8.5%	No
Indiana Rural ACO II	Jan-16	2016	Primary Contact	5	2	82	25.6%	29.3%	No
Indiana Rural ACO	Jan-16	2016	Primary Contact	15	11	346	24.9%	24.3%	No
Michigan Rural ACO	Jan-16	2016	Primary Contact	12	10	366	28.7%	18.3%	No
Michigan Rural ACO II	Jan-16	2016	Supplement	11	10	371	37.7%	11.9%	No
New Hampshire Rural ACO	Jan-16	2016	Primary Contact	11	9	625	21.1%	9.9%	No
National Rural ACO 14	Jan-16	2016	Supplement	26	13	537	33.0%	11.5%	No
National Rural ACO 16	Jan-16	2016	Primary Contact	15	8	481	28.9%	17.7%	No
North Mississippi ACO	Jan-16	2016	Supplement	1	0	223	46.6%	35.4%	Yes
National Rural ACO 20	Jan-16	2016	Primary Contact	17	11	279	44.4%	26.2%	No
Minnesota Rural ACO	Jan-16	2016	Supplement	3	5	382	32.7%	11.5%	No
National Rural ACO 22	Jan-16	2016	Primary Contact	6	6	271	42.8%	14.4%	No
National Rural ACO 23	Jan-16	2016	Primary Contact	18	14	448	34.2%	11.8%	No

ACO Name	AIM Start Date	SSP Start Year	Formation Type	# Practices (TINS)	# Facility-Based Participants	# Practitioners (TIN-NPIs) [a]	Percent Primary Care Practitioners	Percent Non-Physician Practitioners	Only Physician Practices?
National Rural ACO 24	Jan-16	2016	Supplement	13	11	387	34.1%	14.0%	No
Aledade Kansas ACO	Jan-16	2016	Implementer	18	4	74	62.2%	27.0%	No
Aledade West Virginia ACO	Jan-16	2016	Implementer	13	0	35	74.3%	20.0%	Yes
Heartland Physicians ACO	Jan-16	2016	Implementer	7	2	120	40.8%	15.0%	No
Alliance ACO	Jan-16	2016	Implementer	14	1	34	85.3%	8.8%	No
Kentucky Primary Care Alliance	Jan-16	2016	Implementer	11	11	311	50.2%	32.5%	No
Aledade Mississippi ACO	Jan-16	2016	Implementer	23	2	167	34.1%	32.3%	No
Tar River Health Alliance	Jan-16	2016	Independent	1	0	78	37.2%	16.7%	Yes
Affiliated ACO	Jan-16	2016	Independent	1	0	210	36.7%	14.8%	Yes
California ACO	Jan-16	2016	Independent	21	4	99	62.6%	12.1%	No
San Juan Accountable Care Organization	Jan-16	2016	Primary Contact	15	7	200	39.0%	11.5%	No
Rocky Mountain Accountable Care Organization	Jan-16	2016	Primary Contact	12	10	398	41.2%	9.5%	No
MissouriHealth+	Jan-16	2016	Supplement	14	15	1386	34.3%	11.3%	No
Beacon Rural Health	Jan-16	2016	Independent	5	5	318	24.8%	9.4%	No
Test 2 AIM ACOs									
Physicians Collaborative Trust of Mississippi Gulf Coast	Apr-15	2012	Independent	19	0	47	29.8%	27.7%	Yes
Baroma Healthcare International	Apr-15	2013	N/A	76	1	181	40.9%	11.6%	No
The Premier Healthcare Network	Apr-15	2013	Independent	27	0	82	29.3%	15.9%	Yes
Akira Health	Apr-15	2013	Implementer	31	0	35	74.3%	2.9%	Yes
Sunshine ACO	Jan-16	2014	Independent	14	0	42	38.1%	31.0%	Yes
PremierMD ACO	Jan-16	2014	Independent	85	10	153	43.8%	7.2%	No

Source: ACO Provider RIFs for 2015 and 2016. TIN= tax identification numbers; NPI = National Provider Identifier.

[a] The number of practitioners reported here represents those billing under the physician practices, FQHCs, and RHCs participating in AIM ACOs. It excludes practitioners billing under hospitals participating in AIM ACOs.

Appendix 3B. Assigned Beneficiary Characteristics in First Performance Year

ACO Name	# Assigned Benes	Female	Age	White	Black	Hispanic	Other Race	Dual	Disabled	ESRD	Lagged HCC Score [a]	Lagged # of CCs [a]	Mortality	Medicare Payment [b]
Test 1 AIM ACOs														
Carolina Medical Home Network ACO	12,647	58.6%	67.2	46.2%	48.5%	3.4%	1.9%	45.5%	46.4%	1.7%	1.05	2.4	2.8%	$808
Illinois Rural Community Care Organization	19,675	57.8%	72.6	96.7%	0.9%	1.1%	1.3%	20.8%	22.0%	0.7%	0.97	2.4	4.6%	$955
Reid ACO	8,966	56.8%	70.8	95.1%	2.9%	0.3%	1.7%	22.7%	27.4%	1.1%	1.04	2.5	3.5%	$917
Akira Health of Los Angeles	5,379	53.6%	73.7	53.2%	3.6%	15.4%	27.7%	43.8%	16.4%	2.3%	1.27	2.6	5.6%	$1,646
American Rural ACO	6,371	58.9%	71.5	75.5%	8.9%	14.3%	1.3%	22.9%	23.7%	1.8%	1.06	2.5	4.4%	$1,192
Access Care Oklahoma	7,430	58.2%	69.2	80.1%	10.7%	1.3%	7.9%	36.2%	37.5%	1.0%	1.10	2.6	5.0%	$1,014
Citrus County ACO	9,351	56.4%	73.6	93.1%	1.6%	2.2%	3.1%	5.7%	13.9%	0.4%	1.00	2.8	2.7%	$910
AmpliPHY of Texas ACO	7,276	56.9%	71.9	70.0%	12.5%	11.0%	6.6%	20.0%	20.1%	2.3%	1.14	2.6	3.4%	$1,279
AmpliPHY of Kentucky ACO	6,775	56.9%	73.1	94.8%	3.8%	0.3%	1.1%	8.8%	21.5%	0.6%	0.99	2.9	3.2%	$765
National Rural ACO 3	6,261	57.4%	69.1	96.5%	2.5%	0.3%	0.7%	32.6%	38.6%	0.5%	1.04	2.4	3.8%	$883
Avera ACO	10,040	56.1%	74.0	95.3%	0.2%	0.6%	3.8%	15.9%	16.2%	0.9%	0.97	2.3	5.0%	$903
Avera ACO II	9,525	58.1%	74.4	97.7%	0.1%	0.4%	1.8%	13.8%	14.7%	0.5%	0.92	2.2	4.5%	$791
National Rural ACO 6	12,808	56.4%	72.1	75.5%	0.8%	19.5%	4.2%	21.9%	21.3%	1.2%	0.94	2.1	3.5%	$917
Iowa Rural ACO	11,011	57.7%	73.7	97.2%	0.3%	0.9%	1.5%	15.2%	17.1%	0.4%	0.94	2.3	4.5%	$875
Illinois Rural ACO	13,568	56.4%	71.7	96.2%	0.4%	1.5%	1.8%	20.0%	22.5%	0.7%	0.96	2.4	4.1%	$862
Indiana Rural ACO II	5,324	61.1%	72.7	97.1%	0.8%	0.4%	1.7%	22.4%	21.3%	0.8%	1.01	2.5	5.2%	$959
Indiana Rural ACO	13,347	56.9%	71.3	97.8%	0.6%	0.3%	1.3%	26.2%	28.2%	1.0%	1.07	2.4	5.1%	$969
Michigan Rural ACO	10,991	54.0%	71.0	96.9%	0.2%	0.8%	2.1%	21.4%	29.1%	0.8%	1.02	2.3	4.3%	$934
Michigan Rural ACO II	9,435	57.9%	69.9	94.5%	2.0%	1.4%	2.1%	22.2%	29.7%	0.9%	0.97	2.2	3.4%	$838
New Hampshire Rural ACO	11,485	56.9%	71.3	96.8%	0.2%	0.5%	2.6%	20.0%	25.1%	0.3%	0.91	2.2	4.0%	$967
National Rural ACO 14	14,557	56.6%	70.5	96.8%	0.7%	0.6%	1.9%	22.3%	28.2%	0.7%	1.01	2.3	3.6%	$896
National Rural ACO 16	11,594	55.6%	72.8	83.8%	12.3%	2.3%	1.6%	18.5%	23.1%	0.9%	0.95	2.5	3.5%	$948
North Mississippi ACO	18,180	59.2%	69.1	77.1%	21.8%	0.3%	0.8%	30.7%	38.4%	0.9%	0.94	2.3	3.2%	$822
National Rural ACO 20	6,858	55.8%	69.9	68.8%	26.0%	3.9%	1.2%	27.0%	30.4%	1.8%	1.01	2.4	4.4%	$990
Minnesota Rural ACO	4,955	55.6%	72.6	96.6%	0.4%	0.4%	2.6%	22.2%	26.1%	0.9%	1.01	2.3	4.9%	$904
National Rural ACO 22	8,069	57.7%	72.1	96.1%	0.5%	1.3%	2.1%	21.8%	24.6%	0.8%	1.00	2.4	4.5%	$945
National Rural ACO 23	11,117	55.1%	72.8	94.4%	0.1%	1.1%	4.4%	18.7%	21.3%	0.4%	0.92	2.0	4.9%	$869
National Rural ACO 24	8,169	52.4%	71.5	90.5%	0.8%	4.4%	4.3%	16.8%	17.7%	0.5%	0.86	2.0	3.2%	$877
Aledade Kansas ACO	8,741	57.8%	72.2	94.4%	1.4%	2.0%	2.2%	13.2%	18.4%	0.6%	0.90	2.1	3.6%	$817
Aledade West Virginia ACO	7,484	56.1%	70.8	95.8%	3.0%	0.2%	1.0%	14.8%	28.4%	0.8%	1.01	2.6	2.4%	$747

ACO Name	# Assigned Benes	Female	Age	White	Black	Hispanic	Other Race	Dual	Disabled	ESRD	Lagged HCC Score [a]	Lagged # of CCs [a]	Mortality	Medicare Payment [b]
Heartland Physicians ACO	6,088	56.7%	71.7	96.9%	0.8%	0.6%	1.6%	20.4%	21.7%	0.8%	0.92	2.2	4.0%	$784
Alliance ACO	7,366	54.1%	74.3	87.8%	3.7%	7.1%	1.4%	13.3%	13.5%	0.7%	0.97	2.5	4.8%	$969
Kentucky Primary Care Alliance	4,362	59.7%	65.9	93.6%	4.9%	0.7%	0.8%	48.7%	51.2%	1.1%	1.11	2.4	4.2%	$934
Aledade Mississippi ACO	13,067	58.5%	70.6	71.1%	27.4%	0.4%	1.1%	28.8%	31.2%	1.5%	0.98	2.4	4.4%	$855
Tar River Health Alliance	8,691	58.5%	71.3	63.6%	34.0%	0.5%	1.8%	22.5%	27.1%	1.6%	0.95	2.6	3.2%	$818
Affiliated ACO	5,720	56.8%	70.8	94.7%	0.5%	2.4%	2.4%	23.8%	28.2%	0.9%	0.97	2.0	4.3%	$845
California ACO	10,362	56.7%	71.0	83.8%	1.5%	5.2%	9.5%	26.8%	26.9%	0.6%	0.97	2.2	3.4%	$956
San Juan Accountable Care Organization	7,341	53.3%	72.6	92.7%	0.1%	4.2%	3.0%	8.9%	11.3%	0.4%	0.84	1.8	2.9%	$730
Rocky Mountain Accountable Care Organization	13,300	53.7%	71.8	94.6%	0.2%	1.9%	3.3%	12.7%	19.5%	0.3%	0.81	1.8	2.7%	$815
MissouriHealth+	7,032	58.1%	61.0	87.0%	9.6%	1.7%	1.7%	49.4%	59.7%	0.8%	0.99	2.1	2.1%	$721
Beacon Rural Health	6,299	55.8%	71.8	97.3%	0.1%	0.2%	2.4%	35.6%	25.3%	0.6%	0.95	2.3	4.5%	$944
Test 2 AIM ACOs														
Physicians Collaborative Trust of Mississippi Gulf Coast	5,046	58.7%	70.4	80.5%	14.1%	1.6%	3.8%	18.7%	26.9%	0.9%	0.97	2.4	3.3%	$878
Baroma Healthcare International	5,955	62.9%	72.7	21.4%	6.4%	70.7%	1.5%	69.2%	24.3%	2.8%	1.53	3.5	6.2%	$1,939
The Premier Healthcare Network	5,379	58.7%	70.8	45.8%	50.3%	1.5%	2.5%	26.0%	27.8%	3.4%	1.08	2.5	5.0%	$1,040
Akira Health	7,977	59.3%	74.5	70.1%	1.6%	16.1%	12.3%	15.9%	14.1%	1.6%	0.97	2.4	5.3%	$1,598
Sunshine ACO	4,954	60.5%	71.8	24.1%	0.3%	74.5%	1.0%	59.0%	25.5%	2.9%	1.30	3.0	3.5%	$1,130
PremierMD ACO	5,205	57.6%	71.6	56.3%	16.3%	22.1%	5.3%	30.8%	20.6%	1.2%	1.18	2.7	3.5%	$1,345

Source: Medicare claims and enrollment data for first performance year.
[a] HCC score and chronic condition flags were lagged by three years – see **Appendix 4B** for further discussion.
[b] Baseline per beneficiary per month average total Medicare expenditures.

Appendix 3C. Chronic Condition Categories

Original Chronic Condition Categories (27)	New Chronic Condition Categories (11)
Breast cancer Colorectal cancer Endometrial cancer Prostate cancer Lung cancer	Cancer
Acute Myocardial Infarction Congestive Heart Failure Ischemic Heart Disease Atrial Fibrillation Hypertension	Cardiac
Alzheimer's Dementia	Neurological
Stroke	Stroke
Diabetes Hyperlipidemia Anemia Hypothyroidism Hyperplasia	Endocrine
Glaucoma Cataract	Eye
Osteoporosis Rheumatoid or Osteo Arthritis	Rheumatoid conditions
Depression	Depression
Asthma COPD	Respiratory conditions
Chronic Kidney Disease	Chronic Kidney Disease
Hip Fracture	Hip Fracture

Source: Chronic Condition Warehouse: https://www.ccwdata.org/web/guest/condition-categories

Appendix 3D. ACO Geographic Characteristics in First Performance Year

ACO Name	Year	States	Rurality [a]	Primary Care HPSA [b]	Mental Care HPSA [b]	Favorability Score [c]
Test 1 AIM ACOs						
Carolina Medical Home Network ACO	2016	NC	72.9%	11.9%	51.8%	29.50
Illinois Rural Community Care Organization	2016	IL	91.7%	23.8%	97.1%	28.21
Reid ACO	2016	OH, IN	97.4%	9.0%	98.3%	30.36
Akira Health of Los Angeles	2016	CA	0.9%	3.6%	16.4%	57.53
American Rural ACO	2016	TX	60.6%	26.2%	58.5%	42.45
Access Care Oklahoma	2016	OK	76.3%	22.9%	49.4%	27.33
Citrus County ACO	2016	FL	0.3%	0.0%	0.0%	47.58
AmpliPHY of Texas ACO	2016	TN, TX	12.3%	9.0%	17.3%	45.88
AmpliPHY of Kentucky ACO	2016	IL, KY	99.1%	32.2%	100.0%	30.54
National Rural ACO 3	2016	KY, NC	86.2%	5.0%	67.9%	36.93
Avera ACO	2016	MN, SD	100.0%	14.8%	99.9%	6.82
Avera ACO II	2016	IA	98.8%	15.5%	100.0%	7.48
National Rural ACO 6	2016	NE, NM, CO	80.7%	42.7%	100.0%	17.46
Iowa Rural ACO	2016	IL, IA	97.7%	14.6%	98.9%	13.34
Illinois Rural ACO	2016	IL	75.2%	5.1%	76.9%	29.40
Indiana Rural ACO II	2016	IN	82.2%	1.5%	52.0%	33.29
Indiana Rural ACO	2016	KY, IN	91.0%	16.9%	32.8%	32.30
Michigan Rural ACO	2016	MI, WI	96.7%	15.9%	98.8%	24.83
Michigan Rural ACO II	2016	MI, WI	75.8%	12.9%	55.6%	28.28
New Hampshire Rural ACO	2016	NH, VT	97.2%	4.3%	53.9%	n/a [d]
National Rural ACO 14	2016	PA, OH, WV	78.4%	14.4%	48.5%	36.73
National Rural ACO 16	2016	AL, MS, WA, ID	84.5%	33.3%	97.7%	24.65
North Mississippi ACO	2016	MS	99.9%	31.1%	99.7%	25.70
National Rural ACO 20	2016	GA, SC, FL	66.5%	24.1%	97.2%	31.54
Minnesota Rural ACO	2016	MN, WI	97.6%	3.1%	50.6%	14.20
National Rural ACO 22	2016	OR, IN	82.0%	1.5%	83.2%	22.08
National Rural ACO 23	2016	MT, WY, ID	97.5%	1.3%	94.6%	0.59
National Rural ACO 24	2016	NV, ND, CA	97.5%	24.6%	50.4%	33.96
Aledade Kansas ACO	2016	KS	84.9%	2.6%	86.2%	17.31
Aledade West Virginia ACO	2016	WV	4.2%	2.8%	13.7%	32.40
Heartland Physicians ACO	2016	IA, WI, IL	34.3%	3.3%	94.7%	18.79

ACO Name	Year	States	Rurality [a]	Primary Care HPSA [b]	Mental Care HPSA [b]	Favorability Score [c]
Alliance ACO	2016	TX	96.8%	10.2%	87.5%	41.35
Kentucky Primary Care Alliance	2016	KY	85.8%	38.4%	58.0%	35.08
Aledade Mississippi ACO	2016	MS, TN	87.0%	38.3%	86.8%	30.60
Tar River Health Alliance	2016	NC	13.9%	0.4%	87.2%	36.86
Affiliated ACO	2016	MN	99.3%	7.8%	100.0%	23.26
California ACO	2016	CA	78.0%	3.5%	77.7%	34.99
San Juan Accountable Care Organization	2016	CO	100.0%	0.2%	100.0%	8.10
Rocky Mountain Accountable Care Organization	2016	CO, ID, WA	87.4%	60.4%	99.3%	19.49
MissouriHealth+	2016	MO	52.1%	26.5%	52.8%	22.92
Beacon Rural Health	2016	ME	92.1%	3.3%	31.3%	n/a [d]
Test 2 AIM ACOs						
Physicians Collaborative Trust of Mississippi Gulf Coast	2015	MS	0.8%	0.9%	100.0%	32.18
Baroma Healthcare International	2015	FL	0.7%	0.0%	0.3%	100.00
The Premier Healthcare Network	2015	GA	0.0%	1.5%	37.1%	40.00
Akira Health	2015	CA	0.5%	0.1%	0.0%	43.98
Sunshine ACO	2016	TX	3.9%	1.8%	100.0%	57.26
PremierMD ACO	2016	FL	0.0%	0.0%	0.0%	74.98

[a] Rurality is measured by the percent of the ACO's assigned beneficiaries residing in a ZIP code with a RUCA code equal to or greater than 4 on a scale of 1 to 10, with 10 indicating most rural.
[b] HPSA = health professional shortage area; data available from HRSA.
[c] Market favorability scores refer to a Hospital Referral Region (HRR)-level measure of favorability to ACO formation (see **Chapter 3.3.3**).
[d] Due to incomplete data, seven HRRs were dropped from the analysis, resulting in missing favorability scores for two Test 1 AIM ACOs: New Hampshire Rural ACO and Beacon Rural Health.

Appendix 3E. Methodology for Calculating Market Favorability Scores for ACO Formation

Literature Review

To create ACO favorability scores for ACO formation, we conducted a literature review and an environmental scan to identify appropriate factors and data sources. We reviewed the literature on the factors that affect ACOs' intended outcomes—to improve patient health outcomes while reducing spending through coordinated care (CMS, 2015). Our review examined the clinical risk of quality and cost improvement in relation to the three primary goals of accountable care arrangements: (1) improved population health, (2) improved quality of care, and (3) reductions in health care spending and resource use (HHS, 2011).

We limited our search to literature published between 2010 and 2016 from a variety of online sources, with most retrieved through databases such as EBSCO, Health Affairs, and the Commonwealth Fund. Remaining sources were found via detailed Google searches to obtain more information on specific themes. Sources include the following:

- *Business Wire*
- *CMS reports, white papers*
- *Health Affairs*
- *Health Data Management*
- *Health Management Technology*
- *Health Research and Educational Trust*
- *Healthcare Executive*
- *Healthcare Financial Management*
- *Hospitals & Health Networks*
- *Information Week*
- *Journal of General Internal Medicine*
- *Kaiser Family Foundation*
- *Leavitt Partners*
- *Mayo Clinic Proceedings*
- *MDAdvisor*
- *Medical Practice Management*
- *Modern Healthcare*
- *The Commonwealth Fund*
- *The New England Journal of Medicine*

1. Factors Identified

Via the literature review, we identified the five health care domains noted earlier that are associated with market favorability for ACOs, i.e., with achieving financial and quality-related goals following ACO setup and implementation, per the goals of the Shared Savings Program. Following the literature review, we conducted an environmental scan to determine health care data available to construct each variable that would make up the five health care domains. Below, we provide support from the literature review for the selected areas of measurement, lists of all variables used within each market favorability domain, and the data sources for each variable according to each of the five domains.

a. Health Care Resource Use

Our analysis examined the use of health care resources in relation to the HHS goal for accountable care arrangements of reductions in health care spending and resource use (HHS, 2011). We examined variables associated with this goal to learn more about the level of clinical risk ACOs face during their

early implementation. These variables include measures of health care resource use across many different settings relevant to ACOs (**Exhibit 3E-1**).

The promise of coordinated care to address preventable hospitalizations greatly increases the potential for cost savings and improved health outcomes and utilization. Poor health status has been linked to significantly higher health care expenditures than for patients at lower risk for the same comorbidities (Goetzel et al., 1998). Therefore, markets with healthier populations overall may face lower health care expenditures and utilization, and both are health care resource factors pertinent to ACO formation.

Exhibit 3E-1. Health Care Resource Use Domain, Variables and Data Sources

Variable	Data Source
Spending	
Total Medicare spending per beneficiary per month [a]	CMS HRR Level Demographic, Cost, Utilization, and Quality Data, 2014
Total Medicare Part D spending per beneficiary [b]	Dartmouth Atlas, 2010
Commercial health care expenditures per enrollee per month [c]	Optum data, 2010
Utilization	
Average number of inpatient days per 1,000 Medicare beneficiaries [c]	CMS HRR Level Demographic, Cost, Utilization, and Quality Data, 2014
Skilled nursing facility (SNF) covered days per 1,000 Medicare beneficiaries [d]	CMS HRR Level Demographic, Cost, Utilization, and Quality Data, 2014
Home health visits per 1,000 Medicare beneficiaries [d]	CMS HRR Level Demographic, Cost, Utilization, and Quality Data, 2014
Evaluation and management (E&M) events per 1,000 Medicare beneficiaries [d]	CMS HRR Level Demographic, Cost, Utilization, and Quality Data, 2014
Procedure events per 1,000 Medicare beneficiaries [d]	CMS HRR Level Demographic, Cost, Utilization, and Quality Data, 2014
Test events per 1,000 Medicare beneficiaries [d]	CMS HRR Level Demographic, Cost, Utilization, and Quality Data, 2014
Imaging events per 1,000 Medicare beneficiaries [d]	CMS HRR Level Demographic, Cost, Utilization, and Quality Data, 2014

[a] These figures are price-adjusted and risk-adjusted. The data are available in the CMS Geographic Variation Public Use File and are available using this link: https://www.cms.gov/Research-Statistics-Data-and-Systems/Statistics-Trends-and-Reports/Medicare-Geographic-Variation/GV_PUF.html.
[b] We used the health care component of the consumer price index (published by the Bureau of Labor Statistics) to inflate these 2010 data to 2016 levels.
[c] These are an estimate of private health care spending per capita per month within each HRR. We used the health care component of the consumer price index (published by the Bureau of Labor Statistics) to inflate these 2010 data to 2016 levels.
[d] These data are available in the CMS Geographic Variation Public Use File via the link provided in table note [a].
Notes: We use or construct all variables at the HRR level for the principal component analysis.

b. Demographic and Health Characteristics

Demographic and health characteristics are both potentially associated with ACO formation, making measures associated with this domain essential components to this model (**Exhibit 3E-2**). The health status of the population within a health care market could influence the level of risk associated with taking on a goal of improving health outcomes and reducing spending. Provider and hospital groups may see populations suffering from poorly managed chronic health conditions as "low-hanging fruit" in that many of these patients create an opportunity for improving health outcomes and concomitantly lowering spending through better care management. For example, the results of one study indicate Medicare beneficiaries with five or more chronic conditions are responsible for more than 66 percent of Medicare spending and are 99 times more likely to have a preventable hospitalization (Anderson, 2011). Likewise socioeconomic characteristics have been shown to be associated with greater levels of mortality and

morbidity (Bond Huie, Krueger, Rogers, & Hummer, 2003; Lantz, Golberstein, House, & Morenoff, 2010; Mackenbach et al., 2008; Mackenbach, Meerding, & Kunst, 2010; Hajat, Kaufman, Rose, Siddiqi, & Thomas, 2011; Turrell, Lynch, Leite, Raghunathan, & Kaplan, 2007).

Exhibit 3E-2. Demographic and Health Characteristics Domain, Variables and Data Sources

Variable	Data Source
Percentage female	Area Health Resource Files (AHRF) 2014
Percentage white	AHRF 2014
Percentage black	AHRF 2014
Percentage Hispanic	AHRF 2014
Percentage 75 or older	Dartmouth Atlas, 2010
Percentage Medicaid dual eligible	Dartmouth Atlas, 2012
Percentage with college or more education (only among those 25+ years old)	AHRF 2014
Percentage unemployment	AHRF 2014
Median household income	AHRF 2014
Average number of poor physical health days [a]	Behavioral Risk Factor Surveillance System, 2012
Average number of poor mental health days [a]	Behavioral Risk Factor Surveillance System, 2012
Chronic conditions prevalence: atrial fibrillation, autism, cancer, depression, HIV/AIDS, hepatitis, schizophrenia, hypertension [b]	HRR Level Chronic Conditions Table: Prevalence, Medicare Utilization and Spending, 2014 [c]

[a] We derive HRR-level values for these variables from county-level measures by cross-walking the county with its ZIP Code and assigning each one to an HRR. We took the average of all individual responses within each HRR to construct these measures.
[b] Because several chronic condition variables are highly correlated with one another, we limited the number included in the PCA. Specifically, hypertension is highly correlated with myocardial infarction, heart disease, obesity, and stroke. Because hypertension also had the greatest variance among these chronic conditions, we chose hypertension as a representative chronic condition among this subset.
[c] These data are available at https://www.cms.gov/Research-Statistics-Data-and-Systems/Statistics-Trends-and-Reports/Chronic-Conditions/CC_Main.html.
Notes: We use or construct all variables at the HRR level for the principal component analysis. For all AHRF data, we observe data at the county level and convert to the HRR level using ZIP Code-level data. AHRF data beyond 2014 are available. Because the process of adding those data is relatively resource intensive, we plan to update these variables in the third year of the evaluation.

c. Health Care Quality

Improved health care quality is a key measure of ACO formation. Health care quality measures generally focus on structure, process, outcomes, or patient experience (Morris & Bailey, 2014). As proxies for health care quality, we use variables from four different CMS Compare datasets—Hospital Compare, Nursing Home Compare, Physician Compare, and Home Health Compare (**Exhibit 3E-3**).

Exhibit 3E-3. Health Care Quality Domain, Variables and Data Sources

Variable	Data Source
Overall Commercial Quality Ranking [a]	2013 Optum data
Hospital Compare Variables [b]	
Did physicians communicate well with patients? (percentage responding usually or always)	2014 CMS Hospital Compare
Did patients receive information about new medications from their physicians? (percentage responding usually or always)	2014 CMS Hospital Compare
Did patients receive recovery information from physicians following discharge? (percentage responding usually or always)	2014 CMS Hospital Compare
Hospital quality score (7 or greater on a scale of 10) [c]	2014 CMS Hospital Compare
CMS Hospital Compare summary quality scored	2014 CMS Hospital Compare
Nursing Home Compare Variables [d]	
Nursing facility capacity [e]	2014 CMS Nursing Home Compare
Overall rating (nursing facilities)	2014 CMS Nursing Home Compare
Total weighted health survey score	2014 CMS Nursing Home Compare
Count of substandard quality of care deficiencies on health survey	2014 CMS Nursing Home Compare
Count of quality of care deficiencies	2014 CMS Nursing Home Compare
Physician Compare Variables	
PQRS Composite Score [f]	2014 CMS Physician Compare
Home Health Compare Variables	
Quality of Patient Care Star Rating [g]	2014 CMS Home Health Compare

[a] The overall commercial quality ranking is a composite score developed by Optum to characterize health care quality at the HRR-level across the United States using data from the United Health Care system. The composite score is compiled from approximately 70 different quality measures, including ones for preventive care and care for chronic conditions and measures related to tests, procedures, prescribing patterns, and follow-up post-hospitalization. A z-score is calculated for each measure at the HRR level, and the average of each z-score is used to create the composite measure.
[b] For all Hospital Compare variables, we mapped data points to individual HRRs via the ZIP Code of each hospital and then created an HRR-level variable by taking the average of all values for each HRR.
[c] The hospital quality score is patient-reported score, while the CMS hospital compare summary quality score is a composite score derived using methods from a paper by Jha, Orav, and Epstein (2005) and is a more objective measure compared to the subjective hospital quality score.
[d] For all Nursing Home Compare variables, we create HRR-level measures by taking the weighted average of all nursing home values within an HRR with the weight being the nursing home occupancy rate (total residents divided by total number of beds).
[e] We derive this variable by dividing the number of residents in certified beds by the number of total certified beds available in the 2014 CMS Nursing Home Compare data.
[f] We constructed the PQRS composite score using data available using data available in the CMS Physician Compare Individual Eligible Provider Public Reporting Clinical Quality of Care File (located here). The data file includes data for more than 37,000 eligible providers who each report from one to six PQRS measures. To create the composite score, we assigned eligible providers to an HRR based on their ZIP Codes, which are also available from Physician Compare. For each HRR, we constructed an average for each of the six PQRS measures. We created the composite score by taking the weighted average of these six averages where the weight is the number of reporting physicians per PQRS measure in each HRR.
[g] We assigned each home health agency rating to an HRR based on ZIP Code and use the average of all home health agencies assigned to each HRR to develop an overall rating.
Notes: We use or construct all variables at the HRR level for the principal component analysis. We aggregate all CMS Compare data into our 299 HRRs via ZIP Codes and create an average of weighted average of the variables depending on the information available.

d. Health Care Access

Health care access, especially the availability of sufficiently trained staff, is positively correlated with quality of health care (Hartz et al., 1989; Shortell & Hughes, 1998; Ball, Murrells, Rafferty, Morrow, & Griffiths, 2013). As a result, measures of staffing availability by geographic area may provide an indication of quality of care within that region and be an important determinant of ACO formation. Measures determining medically underserved areas and health professional shortage areas help to measure access to care across geographic areas, population groups, and health care facilities. We include these and other health care access measures in the model (**Exhibit 3E-4**).

Exhibit 3E-4. Health Care Access Domain, Variables and Data Sources

Variable	Data Source
Health professional shortage area score [a]	Health Resources and Service Administration Data Warehouse, 2016
Medically underserved area [b]	Health Resources and Service Administration Data Warehouse, 2016
Number of all physicians per 100,000 residents	Dartmouth Atlas, 2012
Number of all specialists per 100,000 residents	Dartmouth Atlas, 2012
Number of primary care physicians (PCPs) per 100,000 residents	Dartmouth Atlas, 2012
Percentage of beneficiaries who visited a PCP in the past year	Dartmouth Atlas, 2012
Average number of contact days with the health care system per beneficiary	Dartmouth Atlas, 2012
Percentage of beneficiaries who saw a PCP within 14 days after hospital discharge	Dartmouth Atlas, 2012
Acute care hospital beds per 1,000 residents (2012)	Dartmouth Atlas, 2012

[a] For the health professional shortage area score, we created a crosswalk for county-level variables to ZIP Codes and then developed a crosswalk from those ZIP Codes to each HRR. We included a ZIP Code value in more than one HRR for this measure if that ZIP Code appeared in multiple HRRs. For this analysis, we use county-level information available for HPSA Geographic areas on the number of full-time equivalent providers per 1,000 population. The smaller the number in a county, the greater the medical professional shortage.
[b] For the medically underserved area score, we use the "Index of Medical Underservice Score" available from the Health Resources and Services Administration data warehouse. A lower score indicates a greater need for medical services.
Notes: We use or construct all variables at the HRR level for the principal component analysis.

e. Market Structure

Market structure can influence obstacles that health care organizations face during ACO development (**Exhibit 3E-5**). ACOs formed under SSP must employ a health care workforce large enough to provide primary care for at least 5,000 Medicare beneficiaries and must already possess or rapidly invest in integrated systems that facilitate coordinated care. Smaller organizations often lack the financial means to invest in new organizational systems and infrastructure that can support the change to value-based models (Goldberg, Mick, Kuzel, Feng, & Love, 2013). Rural hospitals and physician groups tend to be smaller in size, have a limited workforce, and have more constrained financial resources than their urban counterparts (American Hospital Association, 2013). A 2013 study on ACO formation among rural health clinics found that financing was the greatest barrier to forming an ACO, with 43 percent of surveyed rural clinics reporting their clinic had inadequate capital to upgrade health information technology to meet standards of ACOs (Ortiz, Bushy, Fish, Zhou, & Zhang, 2013). Prior to AIM (and the Advance Payment model that provided prepaid shared savings), some provider groups wishing to form an ACO found the cost of implementing new information systems to be particularly prohibitive, leading many to partner with large hospital systems or insurance companies (Crosson, 2011; Terry, 2012).

System integration and coordinated care management have been identified as key to ACO success (Loweel & Berkto, 2010; Chukmaitov, Harless, Carretta, & Siangphoe, 2015). Theoretically, the more integrated a group of providers, the more likely it is to seamlessly coordinate the care of patients. One review of 25 studies examining the effects of system integration on quality of health care and health care costs found a positive correlation between health system integration and quality of care, with weak evidence of integration's effect on reducing costs (Hwang, Chang, LeClaire, & Paz, 2013). Some studies further explore the type of integrated systems and their relative success. For example, one study found that physician-led SSP ACOs achieved greater savings than their hospital-led counterparts among 2012 and 2013 SSP entrants (McWilliams, Hatfield, Chernew, Landon, & Schwartz, 2016). A Center for Medicare and Medicaid Innovation (CMMI) analysis found no relationship between savings or loss

performance in CMS's Pioneer ACO Model and whether the ACO included a hospital (Pham, Cohen, & Conway, 2014).

Managed care penetration is another important factor in the analysis of market infrastructure. Prior expertise in managed care and financial risk-based contracts can facilitate ACO development (McClellan, McKethan, Lewis, Roski, & Fisher, 2010). Health care markets with previous managed care systems or the presence of primary medical homes will likely face fewer obstacles to forming an ACO than markets where health care organizations must "start from scratch."

Exhibit 3E-5. Market Structure Domain, Variables and Data Sources

Variable	Data Source
Historical health maintenance organization penetration	The Optum Institute, 1998
ACO penetration [a]	Insight Policy Research database, 2016
Percentage of hospitals with closed physician hospital organizations (PHOs) [b]	American Hospital Association, 2015 Survey
Percentage of hospitals with independent practice association [b]	American Hospital Association, 2015 Survey
Percentage of hospitals with open PHOs [b]	American Hospital Association, 2015 Survey
Medicare Advantage penetration	2016 CMS Medicare Advantage Penetration

[a] While there is little evidence that ACO penetration is predictive of more or less ACO formation in the future, the presence of managed care appears to be positively correlated with future ACO formation (McClellan et al., 2010; Tucker & Simon, 2014). This measure of ACO penetration provides a current (as opposed to historic) view of the current ACO penetration landscape and a proxy for presence of managed care.
[b] A PHO generally is a legal organization of hospital staff. A closed PHO is an organization of physicians in a hospital that have been deemed high quality and cost effective. An open PHO is open to any staff member who applies to be part of the organization. They may be mutually exclusive in terms of types of PHOs, but not all hospitals have PHOs.
Notes: We use or construct all variables at the HRR level for the principal component analysis.

Definition of Markets

The health care data referenced in our environmental scan were generally available at two levels. The broadest regional level, the HRR, is a regional health care market in the fee-for-service Medicare population for tertiary medical care that generally requires the services of a major referral center; there are 306 HRRs within the United States (Dartmouth Atlas of Health Care, 2017). More granular data are available at the PCSA level, a region measured by patient travel to primary care provider (Dartmouth Atlas of Health Care, 2017). PCSAs in the United States number 6,542. While PCSA data would enable the model to focus on more precise geographic data because of the smaller size of these areas, fewer health care data were available at the PCSA level than at the HRR level. Following an extensive environmental scan, only 8 of the 50 health care variables selected for modeling in our analysis were available at the PCSA level, whereas 42 of the 50 variables were available at the HRR level.[15] For this reason, we chose HRR as the geographic level for analysis.[16]

We used a 10 percent assigned beneficiary rule to define each HRR as having either an AIM or non-AIM SSP ACO based on 2015 and 2016 beneficiary data from CMS Master Data Management file extracts from September 2016 and January 2017. Thus, we define an HRR as an "AIM ACO HRR" if that market contained at least 10 percent of one or more AIM ACO's assigned beneficiaries in either 2015 or 2016.

[15] To convert variables that were not initially at the HRR level, we used the county-level ZIP Code to crosswalk the county to the HRR.

[16] We collected PCSA-level demographic data to provide descriptive profiles of specific marketplaces at a more granular level. However, we did not include these data in this report or analysis because of the large number of PCSAs and the data they provide. We will deliver these data as a separate data set for future analyses.

Conversely, we define a HRR as not having an AIM ACO if no AIM ACOs served at least 10 percent of their assigned beneficiaries in that HRR in either 2015 or 2016. The definition was analogous for non-AIM SSP ACOs. That is, we define an HRR as a "non-AIM SSP ACO" if that HRR contained at least 10 percent of assigned beneficiaries for at least one non-AIM SSP ACO in either 2015 or 2016.

Principal Component Analysis

We used a PCA to develop the ACO market favorability scores. PCA is a statistical procedure that converts potentially correlated variables into a set of fewer linearly uncorrelated variables called principal components. The transformation is defined in such a way that the first principal component accounts for as much of the variability in the data as possible and accounts for the largest possible variance. In turn, each additional principal component has the highest variance possible under the constraint that it is uncorrelated (i.e., orthogonal) to previous components. By reducing a complex data set to its principal components, the procedure makes the data easier to explore, simplify, and visualize. The approach facilitates categorization and ranking of marketplaces according to ACO favorability.

Because of the large number of potential inputs across the five different domains that might influence the construction of the market favorability score, we opted to construct a two-stage PCA. This approach has at least two advantages over a single-step PCA. First, the two-stage PCA enables us to maintain our groupings of inputs within specific domains that the literature has identified as relevant to market favorability for ACO formation. Second, the two-stage model reduces the possibility of spurious correlation (i.e., statistically significant but perhaps not policy significant) between inputs across distinct domains. At the same time, potential disadvantages to this approach include missing potentially important correlation of primary variables across each domain that are not accounted for in the principal components derived for each domain. On balance, however, eliminating spurious correlation is potentially a greater concern than missing actual correlation that we can still identify via the two-step approach.

In the first step of the two-stage PCA, we conducted a PCA in each marketplace domain across the inputs in that domain. After conducting the PCA, we selected the number of principal components to extract within each domain based on the estimated eigenvalues. Eigenvalues measure the amount of variance across variables within a domain. Larger values mean the eigenvalue explains more variance across variables within a domain. We selected the number of principal components in each domain such that (1) the cumulative proportion of variance explained was 80 percent or more and (2) the marginal contribution to the cumulative proportion of the variance explained of the last principal component selected was just as large or slightly larger than what would be explained by the next principal component. In other words, the cumulative proportion of variance explained had begun to increase at a decreasing rate with the final principal component selected.[17]

Exhibit 3E-6 shows the eigenvalues and cumulative percentage for each domain; the number of principal components chosen for each domain ranged from 5 to 10. This reduced the total number of inputs from 50 to 33 for inclusion in the second stage of the model.

[17] This method is more liberal than a commonly used rule of thumb for PCA know as the "Kaiser rule" (Kaiser, 1960) wherein one selects the number of principal components such that the total proportion of variance explained is 70 percent or more and eigenvalues were not markedly smaller than 1. Under this rule, fewer principal components would be selected in each domain; hence, the Kaiser rule is more conservative. In a sensitivity analysis, we applied the Kaiser rule to our two-step PCA procedure and came to similar high-level conclusions as noted in this report. Of note, 98.7 percent of all HRRs had a favorability score that fell into the same or an adjacent favorability score quintile compared to the primary analysis.

Exhibit 3E-6. Principal Components, Eigenvalues, and Cumulative Variance of Market Favorability Domain

Component	Eigenvalue	Cumulative Proportion of Variance Explained
Health Care Resource Use Domain		
Component 1	5.745	0.58
Component 2	1.133	0.69
Component 3	.923	0.78
Component 4	.713	0.85
Component 5	.483	0.90
Demographic and Health Characteristics Domain		
Component 1	3.354	0.18
Component 2	3.076	0.34
Component 3	2.371	0.46
Component 4	1.941	0.57
Component 5	1.461	0.64
Component 6	1.309	0.71
Component 7	1.144	0.77
Component 8	0.920	0.82
Component 9	0.540	0.86
Component 10	0.418	0.89
Health Care Quality Domain		
Component 1	3.726	0.29
Component 2	2.321	0.47
Component 3	1.405	0.57
Component 4	1.233	0.67
Component 5	1.078	0.75
Component 6	.864	0.82
Component 7	.721	0.87
Component 8	.592	0.92
Health Care Access Domain		
Component 1	3.186	0.35
Component 2	1.715	0.54
Component 3	1.284	0.69
Component 4	.977	0.80
Component 5	.753	0.88
Market Structure Domain		
Component 1	1.833	0.31
Component 2	1.104	0.49
Component 3	.993	0.65
Component 4	.944	0.81
Component 5	.661	0.92

Notes: In a sensitivity analysis, we chose a more conservative number of principal components in total: three from the health care resource use domain, three from the health care access domain, four from the market structure domain, five from the health care quality domain, and six from the demographic and health characteristics domain.

We used information obtained from our literature review to determine the "direction" of influence of each domain-level principal component on market favorability and assigned that direction (a positive or negative sign) to a component based on the contribution of specific inputs to that component. For example, in the health care access domain, health professional shortage area and medically underserved area variables were associated primarily with one principal component, which we interpreted as

negatively associated with health care access, while a second principal component—primarily associated with number of physicians, specialists, and PCPs—was assigned a positive direction because our literature review suggested these inputs were positively associated with health care access and ACO formation.

The second step was to conduct a PCA analysis of the principal components obtained from the first-stage PCAs for each domain. Stated differently, the second stage of the analysis applied PCA to variables that were linear combinations of inputs within each domain. This second stage yielded linear combinations of the first-stage-derived principal components to explain how inputs across the five domains are related to one another. We estimate a component score for each input into the second stage PCA for each HRR. Using these component scores, we create a weighted average for each HRR where the weights are the eigenvalues of each component and this weighted average is the market favorability score. In this model, we chose the first 14 principal components, which explained 84 percent of the cumulative variance (**Exhibit 3E-7**).

Exhibit 3E-7. Principal Components, Eigenvalues, and Cumulative Variance from the Second Stage PCA

Component	Eigenvalue	Cumulative Proportion of Variance Explained
Component 1	5.49	0.20
Component 2	3.90	0.35
Component 3	1.85	0.42
Component 4	1.57	0.47
Component 5	1.37	0.52
Component 6	1.28	0.57
Component 7	1.14	0.61
Component 8	1.11	0.66
Component 9	1.00	0.69
Component 10	0.94	0.73
Component 11	0.85	0.76
Component 12	0.78	0.79
Component 13	0.71	0.81
Component 14	0.67	0.84

Note: In a sensitivity analysis, we chose six principal components in total.

We conducted several analyses after creating the market favorability scores. First, we examined the distribution of the scores and developed a map to study the geographic variation in the scores. Second, we examined the extent to which ACOs have formed across HRR markets by calculating the number of ACOs in groups defined by quintiles of the favorability score distribution. Third, we investigated characteristics of HRRs with high and low scores by comparing HRRs with the highest and lowest favorability scores (the top and bottom quintiles) to those in the middle of the distribution.

References

American Hospital Association. (2013). The opportunities and challenges for rural hospitals in an era of health reform. *TrendWatch.* Retrieved from http://www.aha.org/research/reports/tw/11apr-tw-rural.pdf

Anderson, G. F. (2011). Leadership in creating accountable care organizations. *Journal of General Internal Medicine, 26*(11), 1368–1370.

Ball, J. E., Murrells, T., Rafferty, A. M., Morrow, E., & Griffiths, P. (2013). "Care left undone" during nursing shifts: Associations with workload and perceived quality of care. *BMJ Quality and Safety, 10*, 1–10.

Bond Huie, S. A., Krueger, P. M., Rogers, R. G., & Hummer, R. A. (2003). Wealth, race and mortality. *Social Science Quarterly, 84*(3) 667–684.

Chukmaitov, A., Harless, D. W., Carretta, H. J., & Siangphoe, U. (2015) Delivery system characteristics and their association with quality and costs of care: Implications for accountable care organizations. *Health Care Management Review*, *40(*2), 92–103.

CMS (Centers for Medicare & Medicaid Services). (2015). *Accountable care organizations (ACO).* Retrieved from www.cms.gov/Medicare/Medicare-Fee-for-Service-Payment/ACO

Crosson, F. J. (2011). The accountable care organization: Whatever its growing pains, the concept is too vitally important to fail. *Health Affairs, 30*(7), 1250–1255.

Dartmouth Atlas of Health Care. (2017). *About our regions*. Retrieved from http://www.dartmouthatlas.org/data/region/

Fast Facts All Medicare Shared Savings Program. (2017). Retrieved from https://www.cms.gov/Medicare/Medicare-Fee-for-Service-Payment/sharedsavingsprogram/Downloads/All-Starts-MSSP-ACO.pdf

Goldberg, D., Mick, S., Kuzel, A., Feng, L., & Love, L. (2013). Why do some primary care practices engage in practice improvement efforts whereas others do not? *Health Services Research*, *48*(2 Pt 1), 398–416.

Goetzel, R. Z., Anderson, D. R., Whitmer, R. W., Ozminkowski, R. J., Dunn, R. L., & Wasserman, J. (1998). The relationship between modifiable health risks and health care expenditures: An analysis of the multi-employer HERO health risk and cost database. *Journal of Occupational & Environmental Medicine, 40*(10), 843–854.

Hajat, A., Kaufman, J. S., Rose, K. M., Siddiqi, A., & Thomas, J. C. (2011). Long-term effects of wealth on mortality and self-rated health status. *American Journal of Epidemiology, 173*(2), 192–200.

Hartz, A. J., Krakauer, H., Kuhn, E. M., Young, M., Jacobsen, S. B., Muenz, L., … Rimm, A. A. (1989). Hospital characteristics and mortality rates. *New England Journal of Medicine, 32*, 1720–1725.

Heiser, S., Colla, C., & Fisher, E. (2015, January 22). Unpacking the Medicare shared savings proposed rule: Geography and policy. *Health Affairs Blog*. Retrieved from http://healthaffairs.org/blog/2015/01/22/unpacking-the-medicare-shared-savings-proposed-rule-geography-and-policy/

HHS (U.S. Department of Health and Human Services). (2011, March 31). *Affordable Care Act to improve quality of care for people with Medicare*. Press release.

Hwang, W., Chang, J., LeClaire, M., & Paz, H. (2013). Effects of integrated delivery system on cost and quality. *American Journal of Managed Care, 19*(5), e175–e188.

Jha, A. K., Li, Z., Orav, E. J., & Epstein, A. M. (2005). Care in U.S. hospitals: The Hospital Quality Alliance Program. *N Eng J Med, 353*, 265–274.

Kaiser, H. F. (1960). The application of electronic computers to factor analysis. *Educational and psychological measurement, 20*(1), 141–151.

Lantz, P. M., Golberstein, E., House, J. S., & Morenoff, J. (2010). Socioeconomic and behavioral risk factors for mortality in a national 19-year prospective study of U.S. adults. *Social Science and Medicine, 70*(1), 1558–1566.

Loweel, K., & Berkto, J. (2010) The accountable care organization model: Building blocks for success. *The Journal of Ambulatory Care Management, 33(*1), 81–88.

Mackenbach, J. P., Meerding, J. M., & Kunst, Q. E. (2010). Economic costs of health inequalities in the European Union. *Journal of Epidemiology and Community Health, 65*(5), 412–419.

Mackenbach, J. P., Stirbu, I., Roskam, A. J., Schaap, M., Menvielle, G., Leinsalu, M., Kunst, A.; European Union Working Group on Socioeconomic Inequalities in Health. (2008). Socioeconomic inequalities in health in 22 European countries. *The New England Journal of Medicine, 358*, 2468–2481.

McClellan, M., McKethan, A. N., Lewis, H. L., Roski, J., & Fisher, E. S. (2010). A national strategy to put accountable care into practice. *Health Affairs 29*(5), 982–990.

McWilliams, M. J., Hatfield, L. A., Chernew, M. E., Landon, B. E., & Schwartz, A. L. (2016). Early performance of accountable care organizations in Medicare. *The New England Journal of Medicine, 374*, 2357–2366.

Morris, C., & Bailey, K. (2014). *Measuring health care quality: An overview of quality measures*. Issue brief, May. Retrieved from www.familiesusa.org/sites/default/files/product_documents/HSI%20Quality%20Measurement_Brief_final_web.pdf

Nugent, M. (2010). Payment reform, accountable care, and risk: Early lessons for providers. *Healthcare Financial Management: Journal of the Healthcare Financial Management Association, 64*(10), 38–42.

Ortiz J., Bushy, A., Fish, B., Zhou, Y., & Zhang, H. (2013). Accountable care organizations: Benefits and barriers as perceived by rural health clinic management. *Rural Remote Health, 13*(2), 2417.

Pham, H., Cohen, M., & Conway, P. (2014). The Pioneer accountable care organization model: Improving quality and lowering costs. *Journal of American Medical Association, 312*(16), 1635–1636.

Shortell, S. M., & Hughes, E. F. (1998) The effects of regulation, competition, and ownership on mortality rates among hospital inpatients. *New England Journal of Medicine, 318*(8), 1100–1107.

Terry, K. (2012). Physicians are building their own ACOs. *Hospitals & Health Networks, 86*(11), 45–6.

Tucker, M., & Simon, C. (2014, June). *Market characteristics that support accountable organization growth*. Presentation at 14th Annual AcademyHealth Research Meeting. San Diego, CA.

Turrell, G., Lynch, J. W., Leite, C., Raghunathan, T., & Kaplan, G. A. (2007). Socioeconomic disadvantage in childhood and across the life course and all-cause mortality and physical function in adulthood: Evidence from the Alameda County study. *Journal of Epidemiology of Community Health, 61*, 723–730.

Appendix 3F. AIM Payments and Recoupment

ACO Name	AIM Payment Amount [a]	Cumulative Earned Shared Savings [b]	Recouped Amount
Test 2 AIM ACOs			
Physicians Collaborative Trust of the Mississippi Gulf Coast	$458,808	$0	$0
Baroma Healthcare International	$620,550	$5,194,226	$620,550
The Premier HealthCare Network	$1,094,544	$7,273,574	$1,094,544
Sunshine ACO	$754,518	$7,784,392	$754,518
Akira Health	$1,490,004	$0	$0
PremierMD ACO	$842,946	$2,626,062	$842,946
Test 1 AIM ACOs			
Carolina Medical Home Network Accountable Care Organization	$2,130,000	$0	$0
IL-RCCO	$2,130,000	$0	$0
Reid ACO	$1,722,108	$0	$0
Akira Health of Los Angeles	$1,221,872	$0	$0
Texas Rural ACO	$1,495,220	$0	$0
Access Care Oklahoma	$1,864,456	$0	$0
Citrus ACO	$1,878,084	$3,830,947	$1,878,084
AmpliPHY of Texas ACO	$1,602,752	$0	$0
AmpliPHY of Kentucky ACO	$1,682,400	$1,110,552	$1,110,552
Winding River ACO	$1,678,824	$0	$0
Prairie Hills Care Organization	$2,072,156	$2,165,699	$2,072,156
Great Plains Care Organization	$1,654,932	$0	$0
Mountain Prairie ACO	$2,125,800	$3,136,210	$2,125,800
Iowa Rural ACO	$2,130,000	$2,416,099	$2,130,000
Illinois Rural ACO	$2,130,000	$0	$0
Suburban Health ACO 2	$1,328,076	$1,337,237	$1,328,076
Indiana Rural ACO	$2,130,000	$0	$0
Greater Michigan Rural ACO	$2,130,000	$0	$0
Southern Michigan Rural ACO	$2,041,844	$0	$0
New Hampshire Rural ACO	$2,130,000	$0	$0
Ohio River Basin ACO	$2,130,000	$0	$0
Magnolia-Evergreen ACO	$2,130,000	$4,920,692	$2,130,000
North Mississippi Connected Care Alliance	$2,130,000	$0	$0
Deep South Regional ACO	$1,924,608	$0	$0
Minnesota Rural ACO	$1,498,116	$0	$0
Oregon - Indiana ACO	$1,824,676	$0	$0
Mountain West ACO	$2,124,120	$0	$0
High Sierras-Northern Plains ACO	$1,874,060	$0	$0
Aledade Kansas ACO	$1,693,344	$0	$0
Aledade West Virginia ACO	$1,747,968	$1,566,654	$1,566,654
Heartland Physicians ACO	$1,754,732	$1,131,813	$1,131,813
Alliance ACO	$1,863,228	$0	$0

ACO Name	AIM Payment Amount [a]	Cumulative Earned Shared Savings [b]	Recouped Amount
Kentucky Primary Care Alliance	$1,524,516	$955,460	$955,460
Aledade Mississippi ACO	$2,130,000	$0	$0
Tar River Health Alliance	$1,934,508	$0	$0
Affiliated ACO	$1,414,564	$0	$0
California ACO	$2,130,000	$0	$0
San Juan Accountable Care Organization	$1,669,964	$0	$0
Rocky Mountain Accountable Care Organization	$2,130,000	$0	$0
MissouriHealth+	$1,827,192	$0	$0
Beacon Rural Health	$1,482,916	$0	$0

Source: AIM ACOs Recoupment Risk Track Renewal.xlsx received from CMS on 3/6/2018.
[a] Represents cumulative AIM payments (performance years 1 and 2 for AIM ACOs starting AIM in 2015 and performance year 1 for AIM ACOs starting AIM in 2016).
[b] Earned shared savings for 2015 and 2016 were combined for ACOs participating in SSP in 2015; otherwise, 2016 earned shared savings are shown.

Appendix 4A. Performance Measure Statistical Specification

Separate regressions were estimated for each performance measure and each AIM ACO. We estimated cluster-robust standard errors at the beneficiary level since many beneficiaries appeared across multiple years.[18] Since we used market comparison groups for each ACO, we assumed that all errors within a geographic market are drawn from the same distribution (i.e., there is no correlation of errors within any subunit of the defined geographic market). **Exhibit 4A-1** shows the statistical specification used for each measures mapped by data type.

Exhibit 4A-1. Performance Measures and Corresponding Statistical Specification

Data Type	Performance Measure	Statistical Specification
Continuous payment	• Total Medicare payment • Medicare physician services payment	Generalized Linear Model (GLM) with log link and gamma distributed error
Continuous payment with mass at $0	• Medicare acute inpatient payment • Outpatient payment • Skilled nursing facility payment • Home health payment • Durable medical equipment payment	Two part model. Logit for binary probability of nonzero payment. GLM with log link and gamma distribution error for continuous payment, conditional on any payment
Binary outcomes	• Any inpatient hospitalization • Any observation stay • Any ED visit, no hospitalization • Any ED visit with hospitalization • Any hospice use • Any all cause 30-day readmission • Any hospitalization for ambulatory sensitive condition • Mortality	Logit
Continuous utilization [a]	• Number of E&M visits • Number of imaging events • Number of tests • Number of procedures	GLM with log link and gamma distributed error
Count utilization with hurdle at 0	• Number of inpatient hospitalizations • Number of SNF days	Two-part model. Logit for binary probability of "any utilization" and negative binomial for count of utilization conditional on any utilization

[a] Although these are technically count variables (non-negative and integer-valued), the distribution is so large, with right tails extending into the hundreds, that the data are better approximated by a continuous distribution.

[18] Clustering at the beneficiary level accounts for correlation across observations that would occur when the same beneficiary appears in multiple years.

Appendix 4B. Risk Adjustment

The preferred model accounted for the following observable characteristics:

- *Sex, race/ethnicity (black, Hispanic, other), age (0-64, 65-74, 75-84, >85), ESRD, originally qualified for Medicare due to disability, dual Medicare/Medicaid eligibility, resident of long-term institutional facility*: These characteristics were used in prior peer-reviewed literature and are factors well known to influence health outcomes.
- *HCC score, squared HCC Score*: Previous studies included HCC score. While HCC score was designed to predict total spending, it was not designed to predict utilization outcomes or sub-categories of spending. We therefore hypothesized that the relationship between our measures and HCC score might be nonlinear and thus include HCC squared in models. This approach was confirmed by empirical tests showing that squared HCC score was strongly and significantly correlated with our measures of interest, even conditional on chronic condition indicators. Both HCC and HCC squared were lagged by three years so that AIM participation does not influence these characteristics. Applying a three-year lag (rather than a one-year lag) allows for consistent risk adjustment models through the three performance years for which this evaluation will cover.[19]
- *Chronic condition indicators, number of concurrent chronic conditions (two, three, four, five, six or more)*: Chronic conditions and counts of multiple chronic conditions influence health outcomes and were used to control for health status in the prior literature. We categorized the 27 available chronic condition indicators into 11 groups (see **Appendix 3C** for a listing) and included indicators for counts of the number of conditions. All chronic condition variables were also lagged by three years for the same reasons as described above.[20]
- *Received treatment from AIM provider but was not assigned to AIM ACO*: We included an indicator to differentiate beneficiaries in the comparison group who had received some treatment from AIM ACOs from those that did not. These beneficiaries who received "spillover" care were significantly less healthy and had higher spending on average than non-spillover comparison beneficiaries. We did not think it was valid to remove these beneficiaries from the analytic sample as they are part of the ACO's market, but we separately control for them since they clearly differ from standard comparison beneficiaries in important ways.
- *Death in year*: An indicator for a beneficiary dying in the year was included in all performance measure models except for the mortality regression. Prior literature is mixed on its inclusion.[21] If mortality is influenced by AIM, it would not be appropriate to control for it, but if mortality is unlikely to be influenced by AIM, not including it could bias our estimates because it is such a strong predictor of health care spending and is highly correlated with other outcomes. Therefore, small differential changes in the mortality rate over time between the AIM and comparison groups that were unrelated to AIM could bias our estimates. Ultimately, we included a control for mortality in the

[19] If a beneficiary did not have a three-year lagged HCC score, then we used their "New Enrollee" HCC score from any time in the last three years as the lagged HCC score.

[20] If a beneficiary did not have three-year lagged chronic condition flags, then we coded the flags (and the sums of the flags) as zero. We included an additional indicator for "missing lagged variables" that equaled one if the lagged chronic condition flags were missing, and zero otherwise.

[21] Nyweide et al. (2015) control for death, while the other studies listed in footnote 27 do not.

preferred specification, which errs on the side of conservative estimates of AIM impacts (i.e., potentially understating the savings) attributable AIM. Further discussion of the rationale for this decision and additional steps we will take to ensure the robustness of our findings in future reports is located in **Appendix 4E**.

- *Months eligible for Medicare during year*: We included controls for each beneficiary's number of eligible months in the year. The primary reason for fewer than 12 eligible months in a year is mortality, but may also be from new Medicare enrollment.[22] Since utilization measures are "per year," controlling for eligible months ensures that measures are estimated on the same relative time across all beneficiaries. Although spending measures are "per month," a beneficiary's average monthly spending is more precise with 12 months of spending data than with fewer than 12 months of data. Therefore, controlling for eligible months will account for variation in the spending measures.

Lastly, we included PCSA fixed effects[23] and year fixed effects. We did not include any market-level variables for each AIM ACO since market comparison groups were designed so that the treatment and comparison groups face similar market environments. Moreover, ACO markets are geographically confined, so there is little variation in rurality or economic conditions that could bias our impact estimates if they were excluded or that could improve efficiency if they were included.

[22] Per the SSP eligibility criteria, we excluded beneficiaries with any months of Part C or any months of only Part A or B from the sample.

[23] All assigned beneficiaries outside of the defined ACO market were assigned to a single, artificial PCSA, so that the model controlled for "living outside of ACO market." For the average AIM ACO, 7.3 percent of beneficiaries lived outside the ACO market.

Appendix 4C. Parallel Trends Testing

We tested the parallel trend assumption for total Medicare payment for each AIM ACO using the following approach:

- We limited the sample to the baseline period (2013-2015) so that AIM did not influence total Medicare payment.
- We estimated the full risk-adjustment model (including EB weights) with two linear time trends across 2013-2015: one for beneficiaries assigned to an AIM ACO, and one for comparison beneficiaries from the ACO's market.
- We tested whether the two time trends were significantly different from one another at the 5 percent level. A significant difference implies that the AIM ACOs and their market comparison groups were not following parallel trends in the baseline.

As a robustness check, we repeated this test by estimating a more flexible model. Instead of a linear time trend for AIM ACOs, this model included indicator variables for AIM ACOs in each baseline year. We then calculated the change between AIM ACOs and the comparison group from 2013 to 2014 and from 2014 to 2015, and tested for the joint significance of these two changes over time. This methodology allowed for a non-linear trend between 2013 and 2015. Results from this version of the parallel trends test were virtually identical to those using a linear trend, suggesting that the linear time trend sufficiently approximated the true underlying trend. Results from the parallel trends test are discussed in the appendix.

The parallel trends assumption failed for 11 AIM ACOs at the 5 percent significance level and four AIM ACOs at the 1 percent significance level. Although this failure rate was higher than what we would have expected due to chance alone, we believe that the impact estimates reported below are reliable overall. The parallel trend assumption appears to hold on average. Moreover, the mean difference in trends across the baseline period was only 2.3 percent of mean spending in 2013, which is small, both in absolute terms and relative to the average impact estimate. Finally, among the 11 ACOs that failed the test, some were positive and others were negative, which contrasts with the impact estimates, where all significant results were negative in magnitude. Thus, while individual impact estimates for certain ACOs have the potential to be biased, on average the level of bias is minimal.

To get a sense of the accuracy of the significant impact estimates for each AIM ACO, we compared the results of parallel trend tests to the impact estimates. Of the eight AIM ACOs for which changes in total Medicare spending were statistically significant, only three did not pass the parallel trends test. In other words, the majority of AIM ACOs that achieved statistically significant savings did not deviate substantially from the market comparison group prior to the start of AIM.

In future analyses, we plan to estimate the overall effect of AIM based on a pooled model that includes all 41 AIM ACOs. We believe that this model is likely to pass the parallel trends test since small discrepancies in trends at the local level should average out to zero.

Appendix 4D. Number of Treatment and Comparison Beneficiaries in First AIM Performance Year

Test 1 AIM ACO	Number of Beneficiaries Assigned to ACO in First Performance Year	Number of Comparison Beneficiaries in First Performance Year
Carolina Medical Home Network ACO	12,647	99,921
Illinois Rural Community Care Organization	19,675	72,675
Reid ACO	8,966	27,177
Akira Health of Los Angeles	5,379	211,992
American Rural ACO	6,371	37,102
Access Care Oklahoma	7,430	148,490
Citrus County ACO	9,351	51,462
AmpliPHY of Texas ACO	7,276	150,367
AmpliPHY of Kentucky ACO	6,775	25,912
National Rural ACO 3	6,261	41,863
Avera ACO	10,040	13,417
Avera ACO II	9,525	13,849
National Rural ACO 6	12,808	41,290
Iowa Rural ACO	11,011	23,756
Illinois Rural ACO	13,568	37,185
Indiana Rural ACO II	5,324	37,127
Indiana Rural ACO	13,347	43,071
Michigan Rural ACO	10,991	39,399
Michigan Rural ACO II	9,435	55,073
New Hampshire Rural ACO	11,485	19,553
National Rural ACO 14	14,557	72,148
National Rural ACO 16	11,594	70,742
North Mississippi ACO	18,180	56,182
National Rural ACO 20	6,858	61,714
Minnesota Rural ACO	4,955	32,571
National Rural ACO 22	8,069	33,942
National Rural ACO 23	11,117	40,446
National Rural ACO 24	8,169	49,193
Aledade Kansas ACO	8,741	35,124
Aledade West Virginia ACO	7,484	90,655
Heartland Physicians ACO	6,088	25,954
Alliance ACO	7,366	38,499
Kentucky Primary Care Alliance	4,362	49,572
Aledade Mississippi ACO	13,067	138,780
Tar River Health Alliance	8,691	27,238
Affiliated ACO	5,720	9,021
California ACO	10,362	145,815
San Juan ACO	7,341	7,732
Rocky Mountain ACO	13,300	47,970
MissouriHealth+	7,032	184,476
Beacon Rural Health	6,299	17,651

Appendix 4E. Exploring Mortality for Risk Adjustment

In determining whether mortality should be a risk adjustment factor in the main DID regression specification, we took into account four potential considerations:

1. **AIM ACO increases mortality.** In this case, average spending among AIM-assigned beneficiaries would increase during the intervention period, and this increase in spending should be attributed to the AIM program. Erroneously controlling for mortality would then bias our spending estimates downward (more negative).
2. **AIM ACO decreases mortality.** As in the case of increased mortality, our estimates would be biased by over-controlling the model. In this case, our spending estimates would be biased upward (more positive).
3. **AIM ACO appears to decrease mortality because ACOs selectively target healthier patients**. In this case, average spending among AIM-assigned beneficiaries will decrease during the intervention period, but not due to improved care quality from AIM ACOs. In this case, controlling for mortality will prevent this type of false savings from being attributed to the AIM ACOs.
4. **Mortality increases or decreases among AIM ACOs during the intervention period due to chance**. In this case, controlling for mortality prevents potential bias caused by random changes in mortality, unrelated to AIM.

Prior to estimating any mortality models, we hypothesized that (1) was unlikely, since AIM incentivizes higher care quality. Results from the mortality models (shown in **Appendix 4F**) support this hypothesis. In the case of (3) and (4), our model protects against falsely attributing lower spending to the AIM ACO program due to changes other than improved quality. This means that only in the case of (2) are our results potentially biased when controlling for mortality. We note that in this case the results are upward biased (more positive). That is, estimated spending would be more than the actual spending. Thus, our decision to control for mortality provides conservative estimates that may actually overstate the extent of spending attributable to AIM ACO. In future reports, we will conduct additional sensitivity analyses in an attempt to determine whether (2), (3), or (4) are occurring and revisit the topic of whether it is appropriate to control for morality.

Related to mortality, we also control for months of Medicare Part A and B eligibility. Since the primary reason for fewer than 12 eligible months in a year is mortality, months of eligibility and mortality are closely related. Since utilization measures are "per year," controlling for eligible months ensures that measures are estimated on the same relative period across all beneficiaries. Although spending measures are "per month," a beneficiary's average monthly spending is more precise with 12 months of spending data than with fewer than 12 months of data. Therefore, controlling for eligible months will account for variation in the spending measures.

Appendix 4F. Test 1 AIM ACO DID Results in the First Performance Year

Exhibit 4F-1. Per Beneficiary Per Month Medicare Spending (Total, Acute inpatient, Outpatient and Physician)

ACO Name	Total Spending		Inpatient Spending		Outpatient Spending		Physician Spending	
	Estimate	P-value	Estimate	P-value	Estimate	P-value	Estimate	P-value
Carolina Medical Home Network ACO	-42.82	0.027	-17.72	0.092	5.43	0.123	-1.69	0.516
Illinois Rural Community Care Organization	-6.74	0.707	4.95	0.561	-8.43	0.007	-2.65	0.274
Reid ACO	59.46	0.055	10.56	0.449	8.07	0.242	1.85	0.513
Akira Health of Los Angeles	-5.95	0.910	2.23	0.916	-10.60	0.060	11.68	0.062
American Rural ACO	-4.12	0.919	-9.23	0.583	-3.42	0.590	1.47	0.776
Access Care Oklahoma	28.10	0.309	1.45	0.894	-7.21	0.097	11.55	0.001
Citrus County ACO	-57.67	0.007	-19.80	0.059	-12.97	0.000	18.11	0.001
AmpliPHY of Texas ACO	-41.72	0.285	4.54	0.756	-10.27	0.046	-8.77	0.091
AmpliPHY of Kentucky ACO	-42.44	0.062	-0.84	0.945	-9.25	0.035	-0.89	0.770
National Rural ACO 3	-53.72	0.050	-20.26	0.148	4.92	0.312	-8.06	0.010
Avera ACO	-50.54	0.063	-23.76	0.059	-12.86	0.103	2.01	0.438
Avera ACO II	-42.05	0.089	-9.29	0.477	-6.06	0.318	-2.00	0.546
National Rural ACO 6	-38.85	0.081	-6.23	0.563	-23.20	0.000	2.49	0.299
Iowa Rural ACO	-35.53	0.109	-1.97	0.860	-18.52	0.000	-0.83	0.734
Illinois Rural ACO	-47.81	0.028	-6.42	0.541	1.90	0.592	-0.24	0.943
Indiana Rural ACO II	-15.83	0.652	-7.24	0.662	-1.64	0.800	-11.28	0.000
Indiana Rural ACO	13.00	0.569	0.06	0.995	5.96	0.154	-1.26	0.554
Michigan Rural ACO	30.24	0.171	2.71	0.804	4.54	0.314	4.16	0.120
Michigan Rural ACO II	-11.34	0.605	-5.90	0.612	-8.35	0.064	2.50	0.406
New Hampshire Rural ACO	-92.68	0.000	-0.41	0.975	-23.07	0.000	0.66	0.759
National Rural ACO 14	-0.04	0.999	-2.74	0.786	-6.06	0.112	2.98	0.178
National Rural ACO 16	-141.46	0.000	-53.41	0.000	-22.15	0.000	-8.94	0.000
North Mississippi ACO	18.91	0.255	5.72	0.445	-0.78	0.839	8.64	0.000
National Rural ACO 20	-69.12	0.021	-4.62	0.714	-19.01	0.000	-9.11	0.033
Minnesota Rural ACO	-14.98	0.637	-19.27	0.270	-9.98	0.120	3.93	0.182
National Rural ACO 22	10.02	0.706	-0.30	0.983	2.25	0.620	5.49	0.104
National Rural ACO 23	16.21	0.441	3.46	0.747	1.96	0.706	2.61	0.247
National Rural ACO 24	-22.28	0.360	6.02	0.685	-7.26	0.124	-2.57	0.457
Aledade Kansas ACO	9.03	0.713	-13.66	0.231	-2.97	0.545	9.63	0.003
Aledade West Virginia ACO	-18.03	0.392	-19.01	0.128	-8.01	0.068	2.24	0.398
Heartland Physicians ACO	-68.16	0.012	-14.75	0.285	-13.93	0.013	-1.98	0.594
Alliance ACO	24.72	0.391	-8.90	0.453	2.14	0.619	11.93	0.006
Kentucky Primary Care Alliance	-34.48	0.292	-22.73	0.125	1.39	0.774	-0.24	0.950
Aledade Mississippi ACO	-23.52	0.203	-3.88	0.647	4.26	0.232	-6.12	0.014
Tar River Health Alliance	16.58	0.527	2.38	0.865	1.48	0.793	2.09	0.543
Affiliated ACO	-50.32	0.168	-16.60	0.390	-10.39	0.210	-3.51	0.344
California ACO	-101.18	0.000	-53.36	0.000	-3.71	0.336	3.21	0.222
San Juan ACO	-21.45	0.448	-2.81	0.859	-4.88	0.554	-0.38	0.900
Rocky Mountain ACO	-20.68	0.290	-1.92	0.872	-6.37	0.137	-0.20	0.935

ACO Name	Total Spending		Inpatient Spending		Outpatient Spending		Physician Spending	
	Estimate	P-value	Estimate	P-value	Estimate	P-value	Estimate	P-value
MissouriHealth+	9.04	0.667	7.30	0.561	-9.49	0.031	-1.41	0.632
Beacon Rural Health	-9.22	0.750	0.05	0.997	-12.05	0.092	6.56	0.010

Note: Reported estimate captures the estimated impact of AIM on the performance measure listed in each column based on the DID model described in **Chapter 4**. A description of the claims-based measures is available in **Appendix 2E**.

Exhibit 4F-2. Per Beneficiary Per Month Medicare Spending (SNF, HHA, and DME)

ACO Name	SNF Spending		HHA Spending		DME Spending	
	Estimate	P-value	Estimate	P-value	Estimate	P-value
Carolina Medical Home Network ACO	-5.61	0.064	-2.66	0.076	0.51	-5.61
Illinois Rural Community Care Organization	10.32	0.052	-0.04	0.974	-1.09	10.32
Reid ACO	12.44	0.039	2.17	0.246	0.50	12.44
Akira Health of Los Angeles	2.78	0.796	-4.02	0.214	-0.24	2.78
American Rural ACO	-8.55	0.213	0.14	0.973	-2.17	-8.55
Access Care Oklahoma	2.62	0.408	-4.05	0.129	0.07	2.62
Citrus County ACO	-37.54	0.000	-10.96	0.000	-1.14	-37.54
AmpliPHY of Texas ACO	-6.59	0.187	1.06	0.778	-0.88	-6.59
AmpliPHY of Kentucky ACO	-15.05	0.009	0.37	0.858	0.75	-15.05
National Rural ACO 3	-0.18	0.977	-0.33	0.887	-2.90	-0.18
Avera ACO	-14.30	0.086	0.91	0.356	-0.37	-14.30
Avera ACO II	-32.12	0.000	-0.87	0.473	0.56	-32.12
National Rural ACO 6	11.12	0.071	-0.98	0.536	-0.05	11.12
Iowa Rural ACO	-6.54	0.319	-2.36	0.043	-0.60	-6.54
Illinois Rural ACO	-13.76	0.009	-1.32	0.442	0.13	-13.76
Indiana Rural ACO II	4.03	0.636	-1.91	0.388	2.12	4.03
Indiana Rural ACO	5.41	0.330	-3.95	0.004	-0.95	5.41
Michigan Rural ACO	13.94	0.007	0.53	0.725	0.22	13.94
Michigan Rural ACO II	-1.31	0.718	0.01	0.996	0.36	-1.31
New Hampshire Rural ACO	-21.34	0.007	-6.42	0.001	-1.05	-21.34
National Rural ACO 14	-4.65	0.285	2.49	0.106	0.31	-4.65
National Rural ACO 16	-24.26	0.000	-6.66	0.000	0.06	-24.26
North Mississippi ACO	5.70	0.189	-3.10	0.054	-2.02	5.70
National Rural ACO 20	4.64	0.433	-1.86	0.403	1.37	4.64
Minnesota Rural ACO	2.16	0.781	-2.52	0.044	0.80	2.16
National Rural ACO 22	-3.59	0.555	-2.05	0.267	0.02	-3.59
National Rural ACO 23	11.30	0.096	-0.32	0.807	-1.19	11.30
National Rural ACO 24	-2.79	0.669	-5.57	0.000	0.75	-2.79
Aledade Kansas ACO	1.56	0.825	0.51	0.798	0.88	1.56
Aledade West Virginia ACO	5.33	0.155	-2.97	0.106	-0.67	5.33
Heartland Physicians ACO	-15.86	0.045	1.82	0.315	-1.88	-15.86
Alliance ACO	-11.34	0.071	2.78	0.267	1.77	-11.34
Kentucky Primary Care Alliance	-14.68	0.008	-3.02	0.282	0.96	-14.68
Aledade Mississippi ACO	18.35	0.000	-7.61	0.000	-1.71	18.35
Tar River Health Alliance	-6.05	0.220	2.19	0.244	1.15	-6.05
Affiliated ACO	-9.18	0.336	2.00	0.233	-3.02	-9.18
California ACO	-45.71	0.000	-6.62	0.000	-0.67	-45.71
San Juan ACO	0.65	0.922	-0.61	0.758	-2.16	0.65
Rocky Mountain ACO	-6.43	0.301	-4.24	0.005	0.07	-6.43
MissouriHealth+	5.49	0.247	1.43	0.476	-0.12	5.49
Beacon Rural Health	-2.02	0.825	-0.37	0.843	-1.02	-2.02

Note: Reported estimate captures the estimated impact of AIM on the performance measure listed in each column based on the DID model described in **Chapter 4**. A description of the claims-based measures is available in **Appendix 2E**.

Exhibit 4F-3. Any and Total Stays (Acute hospitalization, ED with and without hospitalization)

ACO Name	Any Acute Stay		Total Acute Stays		ED Visit – No Acute		ED Visit - Acute	
	Estimate	P-value	Estimate	P-value	Estimate	P-value	Estimate	P-value
Carolina Medical Home Network ACO	-0.86	0.030	-0.01	0.101	0.01	0.984	-0.68	0.057
Illinois Rural Community Care Organization	0.07	0.839	0.00	0.501	-0.40	0.327	0.93	0.000
Reid ACO	0.85	0.126	0.01	0.369	-0.02	0.974	0.59	0.220
Akira Health of Los Angeles	0.18	0.770	0.00	0.944	1.03	0.076	0.18	0.755
American Rural ACO	-0.25	0.684	0.00	0.836	0.36	0.603	-0.75	0.163
Access Care Oklahoma	-0.46	0.364	0.00	0.986	-0.88	0.120	1.46	0.001
Citrus County ACO	-1.55	0.001	-0.03	0.007	-0.12	0.790	-1.28	0.002
AmpliPHY of Texas ACO	-0.13	0.799	0.01	0.626	-0.26	0.618	-0.13	0.773
AmpliPHY of Kentucky ACO	-0.55	0.366	-0.01	0.491	-0.37	0.542	0.20	0.687
National Rural ACO 3	-1.32	0.027	-0.02	0.060	0.25	0.715	-0.66	0.171
Avera ACO	-0.73	0.228	-0.02	0.140	-0.70	0.258	-1.16	0.013
Avera ACO II	-0.93	0.125	-0.01	0.239	-2.48	0.000	1.09	0.009
National Rural ACO 6	-1.03	0.018	-0.02	0.058	-1.46	0.004	0.65	0.060
Iowa Rural ACO	0.27	0.584	0.00	0.850	-0.18	0.754	0.01	0.978
Illinois Rural ACO	-0.25	0.570	0.00	0.999	0.05	0.920	-0.17	0.660
Indiana Rural ACO II	0.32	0.624	0.00	0.792	-1.94	0.008	1.99	0.000
Indiana Rural ACO	0.00	0.997	0.00	0.921	0.25	0.597	0.04	0.900
Michigan Rural ACO	-0.47	0.309	-0.01	0.245	-0.32	0.550	-0.26	0.463
Michigan Rural ACO II	-0.04	0.930	-0.01	0.411	-0.56	0.314	-0.17	0.667
New Hampshire Rural ACO	-0.66	0.171	-0.01	0.318	-0.77	0.202	0.45	0.133
National Rural ACO 14	-0.53	0.198	-0.01	0.132	0.83	0.072	-0.78	0.026
National Rural ACO 16	-2.52	0.000	-0.05	0.000	0.00	0.996	-2.36	0.000
North Mississippi ACO	0.14	0.707	0.01	0.202	-0.08	0.834	0.06	0.835
National Rural ACO 20	-0.77	0.165	-0.01	0.404	0.93	0.125	-0.05	0.910
Minnesota Rural ACO	-0.22	0.751	0.01	0.664	-0.06	0.930	-0.17	0.775
National Rural ACO 22	-0.53	0.315	0.00	0.925	0.67	0.276	-0.26	0.498
National Rural ACO 23	-0.61	0.223	0.00	0.661	0.10	0.863	-0.17	0.579
National Rural ACO 24	-0.70	0.166	-0.01	0.325	-1.40	0.012	-0.10	0.790
Aledade Kansas ACO	0.07	0.897	0.00	0.752	-0.78	0.177	0.67	0.071
Aledade West Virginia ACO	-1.07	0.037	-0.02	0.023	-0.25	0.633	-1.91	0.000
Heartland Physicians ACO	-1.28	0.033	-0.02	0.061	-0.64	0.344	-1.94	0.000
Alliance ACO	0.79	0.145	0.00	0.931	-0.27	0.642	0.46	0.298
Kentucky Primary Care Alliance	-0.99	0.153	-0.02	0.192	-2.46	0.002	-0.53	0.360
Aledade Mississippi ACO	-0.63	0.090	-0.01	0.290	0.59	0.132	-0.37	0.254
Tar River Health Alliance	-0.71	0.167	-0.02	0.145	-0.88	0.096	-0.73	0.103
Affiliated ACO	-1.05	0.146	-0.01	0.493	-2.18	0.006	-0.24	0.633
California ACO	-1.30	0.002	-0.03	0.000	0.20	0.643	-1.23	0.001
San Juan ACO	0.00	0.997	0.00	0.824	-0.64	0.408	-0.10	0.852
Rocky Mountain ACO	0.26	0.519	0.01	0.501	-0.43	0.381	0.66	0.011
MissouriHealth+	-0.51	0.342	0.01	0.525	-0.40	0.511	-0.37	0.434
Beacon Rural Health	-0.85	0.170	-0.01	0.238	-0.67	0.379	-0.38	0.338

Note: Reported estimate captures the estimated impact of AIM on the performance measure listed in each column based on the DID model described in **Chapter 4**. A description of the claims-based measures is available in **Appendix 2E**.

Exhibit 4F-4. SNF days, Observational Services, Any Hospice Use

ACO Name	SNF Days		Observational Stays		Any Hospice	
	Estimate	P-value	Estimate	P-value	Estimate	P-value
Carolina Medical Home Network ACO	-0.09	0.311	-0.37	0.224	-0.13	0.235
Illinois Rural Community Care Organization	0.11	0.392	-1.01	0.000	0.09	0.451
Reid ACO	0.46	0.010	0.36	0.377	0.04	0.808
Akira Health of Los Angeles	0.17	0.469	0.37	0.364	0.43	0.096
American Rural ACO	-0.14	0.427	-0.01	0.989	-0.42	0.043
Access Care Oklahoma	0.17	0.087	0.46	0.217	0.00	0.994
Citrus County ACO	-0.98	0.000	-0.83	0.020	-0.38	0.009
AmpliPHY of Texas ACO	-0.10	0.438	-0.59	0.161	-0.02	0.921
AmpliPHY of Kentucky ACO	-0.38	0.023	0.82	0.047	0.07	0.697
National Rural ACO 3	-0.09	0.606	0.60	0.214	-0.21	0.267
Avera ACO	-0.16	0.396	-0.46	0.267	0.03	0.881
Avera ACO II	-0.67	0.000	0.25	0.559	-0.20	0.395
National Rural ACO 6	0.15	0.191	-0.33	0.315	-0.03	0.853
Iowa Rural ACO	0.02	0.880	-1.26	0.001	-0.10	0.587
Illinois Rural ACO	-0.36	0.015	0.26	0.473	-0.16	0.303
Indiana Rural ACO II	0.26	0.302	-0.66	0.171	0.31	0.198
Indiana Rural ACO	0.24	0.136	-0.91	0.009	0.01	0.940
Michigan Rural ACO	0.33	0.005	0.37	0.268	0.05	0.718
Michigan Rural ACO II	-0.04	0.661	0.54	0.154	-0.03	0.862
New Hampshire Rural ACO	-0.24	0.053	-1.39	0.000	-0.17	0.287
National Rural ACO 14	-0.10	0.415	-0.05	0.874	-0.15	0.234
National Rural ACO 16	-0.71	0.000	-0.03	0.926	0.07	0.634
North Mississippi ACO	-0.09	0.444	1.14	0.000	-0.30	0.014
National Rural ACO 20	0.06	0.703	-0.67	0.088	-0.55	0.012
Minnesota Rural ACO	-0.14	0.477	-1.70	0.000	0.53	0.021
National Rural ACO 22	0.00	0.988	-0.44	0.229	-0.29	0.130
National Rural ACO 23	0.30	0.036	-0.71	0.041	-0.22	0.209
National Rural ACO 24	0.04	0.753	-0.87	0.015	-0.37	0.009
Aledade Kansas ACO	0.20	0.146	-0.23	0.554	-0.70	0.000
Aledade West Virginia ACO	0.12	0.281	-1.08	0.011	0.15	0.282
Heartland Physicians ACO	-0.44	0.008	0.34	0.423	-0.65	0.002
Alliance ACO	-0.34	0.077	1.08	0.005	0.07	0.729
Kentucky Primary Care Alliance	-0.43	0.009	0.32	0.551	-0.13	0.536
Aledade Mississippi ACO	0.38	0.001	-0.22	0.439	-0.07	0.557
Tar River Health Alliance	-0.21	0.150	-1.28	0.000	0.25	0.098
Affiliated ACO	-0.16	0.373	-0.34	0.497	-0.42	0.084
California ACO	-0.84	0.000	0.06	0.806	0.15	0.303
San Juan ACO	0.06	0.696	0.29	0.557	-0.13	0.633
Rocky Mountain ACO	0.02	0.885	-0.78	0.004	-0.08	0.484
MissouriHealth+	0.13	0.384	0.13	0.735	-0.11	0.316
Beacon Rural Health	0.14	0.355	-1.04	0.011	-0.12	0.580

Note: Reported estimate captures the estimated impact of AIM on the performance measure listed in each column based on the DID model described in **Chapter 4**. A description of the claims-based measures is available in **Appendix 2E**.

Exhibit 4F-5. E&M Visits, Tests, Procedures, and Imaging Events

ACO Name	E&M Visits		Tests		Procedures		Imaging Events	
	Estimate	P-value	Estimate	P-value	Estimate	P-value	Estimate	P-value
Carolina Medical Home Network ACO	0.19	0.001	1.01	0.000	-0.32	0.001	0.13	0.059
Illinois Rural Community Care Organization	0.28	0.000	0.33	0.001	-0.15	0.086	-0.04	0.484
Reid ACO	0.49	0.000	-0.36	0.041	-0.07	0.551	0.02	0.860
Akira Health of Los Angeles	0.63	0.000	-0.08	0.800	0.44	0.148	0.22	0.096
American Rural ACO	-0.17	0.155	-1.77	0.000	-0.28	0.047	-0.12	0.307
Access Care Oklahoma	0.16	0.076	3.02	0.000	-0.32	0.041	0.30	0.001
Citrus County ACO	0.14	0.184	5.22	0.000	1.27	0.000	0.04	0.661
AmpliPHY of Texas ACO	-0.01	0.932	-1.69	0.000	0.09	0.584	-0.13	0.239
AmpliPHY of Kentucky ACO	0.09	0.296	0.72	0.001	-0.04	0.840	-0.08	0.356
National Rural ACO 3	0.14	0.171	-0.34	0.134	0.00	0.971	-0.20	0.038
Avera ACO	-0.31	0.000	1.32	0.000	0.61	0.000	-0.08	0.323
Avera ACO II	0.70	0.000	1.19	0.000	-0.28	0.058	0.15	0.069
National Rural ACO 6	0.28	0.000	0.31	0.004	-0.16	0.153	-0.05	0.476
Iowa Rural ACO	-0.13	0.047	-0.15	0.206	-0.06	0.558	-0.18	0.012
Illinois Rural ACO	0.22	0.001	0.78	0.000	-0.18	0.180	-0.06	0.385
Indiana Rural ACO II	-0.60	0.000	-0.94	0.000	-0.12	0.217	-0.18	0.074
Indiana Rural ACO	-0.06	0.414	1.22	0.000	0.12	0.115	-0.10	0.118
Michigan Rural ACO	0.14	0.027	0.03	0.772	0.04	0.740	0.40	0.000
Michigan Rural ACO II	0.26	0.000	1.17	0.000	-0.10	0.365	0.05	0.533
New Hampshire Rural ACO	0.04	0.561	0.40	0.000	0.44	0.003	-0.15	0.037
National Rural ACO 14	0.10	0.124	0.86	0.000	0.04	0.690	0.00	0.955
National Rural ACO 16	-0.13	0.032	-0.41	0.004	-0.47	0.000	-0.63	0.000
North Mississippi ACO	0.18	0.001	1.89	0.000	0.39	0.001	0.04	0.486
National Rural ACO 20	-0.32	0.001	0.47	0.015	-0.27	0.076	-0.10	0.299
Minnesota Rural ACO	0.04	0.662	1.25	0.000	-0.02	0.899	0.11	0.297
National Rural ACO 22	0.37	0.000	0.94	0.000	0.00	0.974	-0.13	0.134
National Rural ACO 23	0.18	0.010	0.71	0.000	0.17	0.224	-0.05	0.484
National Rural ACO 24	0.17	0.031	0.14	0.329	-0.48	0.002	-0.09	0.243
Aledade Kansas ACO	0.27	0.001	0.93	0.000	0.01	0.971	0.19	0.020
Aledade West Virginia ACO	-0.03	0.744	-0.13	0.462	0.39	0.043	-0.11	0.204
Heartland Physicians ACO	-0.38	0.000	-0.72	0.006	0.01	0.970	-0.12	0.196
Alliance ACO	0.28	0.007	0.77	0.001	0.41	0.022	0.27	0.003
Kentucky Primary Care Alliance	0.30	0.004	-0.20	0.555	-0.14	0.315	0.01	0.950
Aledade Mississippi ACO	-0.28	0.000	-0.61	0.000	-0.43	0.001	-0.65	0.000
Tar River Health Alliance	0.09	0.253	1.65	0.000	-0.35	0.007	0.05	0.539
Affiliated ACO	-0.19	0.144	-0.01	0.985	-0.34	0.022	-0.03	0.746
California ACO	0.17	0.048	1.78	0.000	0.84	0.000	0.05	0.445
San Juan ACO	0.11	0.294	0.16	0.270	0.00	0.985	-0.02	0.840
Rocky Mountain ACO	-0.02	0.791	0.77	0.000	-0.48	0.000	0.04	0.509
MissouriHealth+	-0.24	0.002	-1.46	0.000	-0.22	0.080	-0.01	0.919

ACO Name	E&M Visits		Tests		Procedures		Imaging Events	
	Estimate	P-value	Estimate	P-value	Estimate	P-value	Estimate	P-value
Beacon Rural Health	0.44	0.000	0.60	0.000	0.43	0.001	-0.04	0.619

Note: Reported estimate captures the estimated impact of AIM on the performance measure listed in each column based on the DID model described in **Chapter 4**. A description of the claims-based measures is available in **Appendix 2E**.

Exhibit 4F-6. Any All-Cause 30-day Readmissions, Any ASC Stay, Mortality

ACO Name	Any Readmission		Any ASC Stay		Mortality	
	Estimate	P-value	Estimate	P-value	Estimate	P-value
Carolina Medical Home Network ACO	-0.19	0.195	-0.23	0.306	-0.26	0.138
Illinois Rural Community Care Organization	0.04	0.817	-0.39	0.058	-0.16	0.396
Reid ACO	0.23	0.311	-0.11	0.700	-0.22	0.407
Akira Health of Los Angeles	0.28	0.376	0.61	0.091	-0.13	0.724
American Rural ACO	-0.17	0.510	0.30	0.415	0.58	0.072
Access Care Oklahoma	-0.18	0.389	0.41	0.170	0.35	0.199
Citrus County ACO	-0.18	0.381	-0.37	0.130	-0.60	0.006
AmpliPHY of Texas ACO	-0.14	0.536	-0.25	0.402	-0.10	0.661
AmpliPHY of Kentucky ACO	-0.06	0.812	-0.63	0.065	-0.83	0.004
National Rural ACO 3	-0.12	0.621	-0.42	0.238	-0.36	0.221
Avera ACO	0.00	0.996	-0.30	0.339	-0.23	0.489
Avera ACO II	-0.10	0.665	-0.39	0.213	-0.22	0.509
National Rural ACO 6	0.00	0.987	-0.44	0.065	-0.98	0.000
Iowa Rural ACO	-0.14	0.441	0.12	0.634	0.19	0.492
Illinois Rural ACO	0.08	0.689	-0.01	0.983	-0.67	0.004
Indiana Rural ACO II	-0.23	0.404	-0.58	0.112	-0.08	0.831
Indiana Rural ACO	-0.23	0.221	0.07	0.779	-0.13	0.609
Michigan Rural ACO	-0.24	0.197	-0.27	0.275	0.79	0.001
Michigan Rural ACO II	-0.15	0.389	0.08	0.767	-0.08	0.729
New Hampshire Rural ACO	0.13	0.485	0.10	0.680	0.24	0.370
National Rural ACO 14	-0.04	0.823	-0.56	0.016	0.08	0.696
National Rural ACO 16	-0.53	0.002	-0.48	0.044	-0.69	0.001
North Mississippi ACO	0.11	0.462	0.19	0.366	-0.18	0.303
National Rural ACO 20	-0.12	0.595	-0.03	0.931	0.15	0.595
Minnesota Rural ACO	0.25	0.337	0.45	0.182	0.25	0.478
National Rural ACO 22	-0.15	0.451	0.10	0.727	0.02	0.941
National Rural ACO 23	-0.19	0.361	-0.07	0.801	0.45	0.095
National Rural ACO 24	-0.06	0.763	-0.21	0.423	-0.26	0.304
Aledade Kansas ACO	-0.07	0.728	0.05	0.853	0.18	0.480
Aledade West Virginia ACO	-0.33	0.092	-0.50	0.060	-0.49	0.029
Heartland Physicians ACO	-0.53	0.030	-0.06	0.856	-0.16	0.594
Alliance ACO	-0.05	0.830	0.41	0.153	0.09	0.759
Kentucky Primary Care Alliance	0.01	0.961	-0.41	0.308	-0.18	0.604
Aledade Mississippi ACO	-0.33	0.023	-0.38	0.061	0.50	0.006
Tar River Health Alliance	-0.45	0.033	-0.44	0.130	0.05	0.828
Affiliated ACO	-0.01	0.982	0.29	0.442	-0.29	0.442
California ACO	-0.52	0.002	-0.70	0.000	-0.42	0.055
San Juan ACO	0.23	0.307	-0.42	0.140	-0.58	0.086
Rocky Mountain ACO	-0.06	0.700	0.18	0.322	-0.30	0.110
MissouriHealth+	0.29	0.053	0.04	0.881	0.33	0.104
Beacon Rural Health	0.42	0.091	0.04	0.895	0.16	0.626

Note: Reported estimate captures the estimated impact of AIM on the performance measure listed in each column based on the DID model described in **Chapter 4**. A description of the claims-based measures is available in **Appendix 2E.**

Appendix 5A. Non-AIM SSP ACO Comparison Groups for Test 2 AIM ACOs

ACO Name	SSP Start Year
Comparison for Physicians Collaborative Trust of the Mississippi Gulf Coast	
Arizona Connected Care	2012
Florida Physicians Trust	2012
Premier ACO Physicians Network	2012
Accountable Care Organization of the North Country	2012
Accountable Care Coalition of Coastal Georgia	2012
Comparison for Baroma Healthcare International, The Premier HealthCare Network & Akira Health	
Accountable Care Coalition of Western Georgia	2013
Primary Care Alliance	2013
Indiana Lakes ACO	2013
Commonwealth Primary Care ACO	2013
APCN-ACO, A Medical Professional Corporation	2013
Christie Clinic Physician Services	2013
Keystone ACO	2013
MCM ACCOUNTABLE CARE ORGANIZATION	2013
Accountable Care Coalition of Georgia	2013
Morehouse Choice ACO-ES	2013
Integral Healthcare	2013
Indiana Care Organization	2013
Paradigm ACO	2013
Southern Maryland Integrated Care	2013
Comparison for Sunshine ACO & PremierMD ACO	
ACO Providers	2014
Redwood Community Care Organization	2014
Primary Comprehensive Care ACO	2014
PHYSICIAN FIRST ACO	2014
North Collaborative Care	2014
ACMG	2014
Midwest Health Coalition ACO	2014
Carolinas ACO	2014
NEPA ACO Company	2014
Orange Accountable Care of South Florida	2014
Physician Direct Accountable Care Organization	2014
ACONA	2014
Allied Physicians ACO	2014
FamilyHealth ACO	2014
Allegiance ACO	2014
Primary PartnerCare ACO Independent Practice Association	2014
Premier Choice ACO	2014
New York State Elite (NYSE) ACO	2014
Huntington Care Network ACO	2014
Live Oak Care	2014
Central US ACO	2014
Buena Vida y Salud	2014
Emerald Physicians	2014
Loudoun Medical Group ACO	2014

ACO Name	SSP Start Year
Oklahoma Health Initiatives	2014
St Vincents Accountable Care Organization	2014
Antelope Valley ACO	2014
Accountable Care Alliance of Ventura	2014
Health Point ACO	2014
PMC ACO	2014
St Joseph Health Partners ACO	2014
Arkansas Accountable Care	2014
Kansas Primary Care Alliance	2014
Integrity Health Innovations	2014
Augusta Care Partners	2014
GGC ACO	2014
Broward Guardian	2014
JFK Health ACO	2014
Community Health Accountable Care	2014
UPSA ACO	2014
Ingalls Care Network	2014
Partners In Care ACO	2014
Akira Health of Fresno	2014
South Bend Clinic Accountable Care	2014
Clinical Partners of Colorado Springs	2014
Physicians Accountable Care of Utah	2014
Louisiana Physicians ACO	2014
RWJ Partners	2014
Cleveland Quality Healthnet	2014
Accountable Care Coalition of Mississippi	2014
Accountable Care Coalition of Greater New York	2014
Accountable Care Coalition of Maryland Primary Care	2014

Appendix 5B. Test 2 Parallel Trend Testing

Test 2 AIM ACOs participated in ACO prior to joining the AIM ACO model. Since the comparison group also comprises non-AIM SSP ACOs that joined in the same year, this prior exposure to ACO in the baseline period would only be problematic if it led to substantial differences in key outcomes of interest relative to comparable non-AIM SSP ACOs. Although all six Test 2 AIM ACOs passed parallel trends tests at the 5 percent statistical significance level, confidence intervals for the estimates of interest were large. These findings indicate that there could be considerable differences in trends of total spending in the baseline period across AIM ACOs and comparable non-AIM ACOs ("pre-trends"), though these trends were not statistically significant. For instance, for one Test 2 AIM ACO (Baroma Healthcare International), the estimate of interest was -$36.56 PBPM. The p-value of 0.799 indicated that the pre-trend was not statistically significant, but the confidence interval ranged from -$318.90 and $245.79 PBPM. While the confidence interval contained zero, we could not completely rule out the possibility of large pre-trends that could influence our impact estimates. Thus, though the Test 2 AIM ACOs passed the parallel trends test, in future analyses, we will consider additional covariate controls that may better control for existing pre-trends.

Appendix 5C. Comparing Test 2 AIM ACOs to Non-AIM SSP ACOs on Performance Measures

	Physicians Collaborative		Baroma		Premier Healthcare		Akira		Sunshine		PremierMD	
	Estimate	P-value	Estimate	P-value	Estimate	P-value	Estimate	P-value	Estimate	P-value	Estimate	P-value
Medicare payments (PBPM)												
Total	14.80	0.71	-387.00	0.00	15.65	0.81	-52.50	0.63	27.21	0.57	27.11	0.71
Acute inpatient	-4.72	0.78	-35.38	0.19	6.84	0.66	6.89	0.85	-17.73	0.52	32.73	0.10
Physician services	15.41	0.02	-40.10	0.01	-4.12	0.81	-18.50	0.14	-1.97	0.90	-15.45	0.23
Hospital outpatient and ambulatory surgery centers	-1.61	0.87	-5.23	0.66	-5.79	0.54	13.72	0.11	-5.85	0.57	-4.81	0.57
Skilled nursing facility	-6.11	0.63	-20.31	0.14	14.18	0.18	6.74	0.83	11.49	0.44	-6.60	0.66
Home health	-8.46	0.11	-41.61	0.00	-0.40	0.90	4.56	0.52	4.56	0.22	-2.10	0.76
Durable medical equipment	0.29	0.80	-0.56	0.66	-1.31	0.27	0.40	0.64	-1.35	0.11	2.00	0.04
Inpatient utilization												
Any acute hospitalization (%)	0.00	0.97	-0.03	0.26	0.02	0.16	0.02	0.32	-0.01	0.62	0.03	0.13
# acute hospitalizations	0.04	0.96	-1.36	0.43	0.77	0.26	0.51	0.66	-0.77	0.36	1.16	0.23
All-cause 30-day readmission (%)	-0.20	0.44	-1.16	0.29	-0.02	0.93	0.37	0.37	-0.23	0.38	0.32	0.39
Any ASC admission (%)	-0.02	0.96	-0.60	0.56	0.38	0.29	0.88	0.19	-0.54	0.21	0.14	0.75
Emergency department and observation utilization												
Any ED visit not resulting in hospital admission (%)	0.34	0.77	0.35	0.85	0.70	0.40	-0.77	0.26	1.20	0.24	0.74	0.35
Any ED visit resulting in hospital admission (%)	-0.01	0.99	-1.12	0.49	0.99	0.16	0.52	0.64	-0.65	0.30	0.82	0.38
Any observation stays (inpatient or outpatient) (%)	-1.48	0.04	1.09	0.58	0.02	0.97	-1.79	0.00	-0.29	0.71	-0.83	0.46
Post-acute care and hospice utilization												
# SNF days	-0.06	0.85	-0.42	0.22	0.37	0.14	0.10	0.84	0.34	0.34	-0.15	0.69
Any hospice use (%)	-0.39	0.09	0.88	0.12	0.37	0.12	0.06	0.83	0.38	0.12	-0.64	0.10
Physician services utilization												
# Physician office-based E&M visits	0.40	0.06	-0.44	0.32	0.03	0.94	-0.53	0.03	0.01	0.99	0.21	0.61
# Imaging events	0.08	0.60	0.03	0.90	-0.20	0.42	-0.12	0.61	-0.15	0.67	-0.04	0.86
# Procedures	0.31	0.53	-1.20	0.05	-0.69	0.18	-0.47	0.27	1.25	0.28	-1.11	0.01
# Tests	1.51	0.08	-2.69	0.04	1.65	0.33	-0.91	0.37	-0.02	0.99	1.02	0.49
Mortality (%)	-0.03	0.92	-0.13	0.86	-0.36	0.41	-0.11	0.76	0.16	0.64	0.27	0.60

Notes: DID estimates comparing beneficiaries assigned to Test 2 AIM ACOs to beneficiaries assigned to comparable non-AIM SSP ACOs. See **Chapter 5** for detailed methodology.

Appendix 5D. Comparing Test 2 AIM ACOs to Non-AIM SSP ACOs on ACO Quality Measures

Performance Measure [a]	AIM BL	AIM PY	Non-AIM BL	Non-AIM PY	DID	AIM BL	AIM PY	Non-AIM BL	Non-AIM PY	DID
	PC [b]	PC [b]	PC [b]	PC [b]	PC [b]	Ba [c]	Ba [c]	Ba [c]	Ba [c]	Ba [c]
Getting Timely Care, Appointments, and Information (ACO #1)	82.44	81.79	80.68	79.18	0.85	83.32	85.39	76.99	75.01	4.05
How Well Your Doctors Communicate (ACO #2)	94.63	93.60	91.98	92.78	-1.82	96.68	95.90	90.62	89.73	0.11
Patients' Rating of Doctor (ACO #3)	94.55	93.23	90.71	91.48	-2.08	94.42	94.92	90.03	89.31	1.22
Access to Specialists (ACO #4)	84.47	83.50	85.09	82.66	1.46	85.20	86.25	83.03	79.91	4.18
Health Promotion and Education (ACO #5)	60.32	62.43	57.71	59.26	0.56	70.23	69.19	55.68	56.00	-1.36
Shared Decision Making (ACO #6)	73.77	79.00	73.20	74.49	3.94	79.78	83.86	72.59	73.64	3.03
Health Status/Functional Status (ACO #7)	69.22	70.08	69.41	72.68	-2.40	65.67	63.79	69.73	70.46	-2.61
Depression screening (ACO #18)	--	--	--	--	--	13.48	8.91	23.55	38.33	-19.35
Colorectal cancer screening (ACO #19)	--	--	--	--	--	26.38	42.41	51.87	50.72	17.19
Mammography screening (ACO #20)	--	--	--	--	--	40.60	58.66	56.58	54.79	19.86
Diabetes poor control (ACO#27)	--	--	--	--	--	36.65	33.57	28.66	30.66	-5.08
Hypertension (blood pressure control) (ACO #28)	--	--	--	--	--	68.16	66.67	65.34	65.22	-1.36
Ischemic vascular disease control (ACO#30)	--	--	--	--	--	70.87	48.15	61.36	71.88	-33.23
Heart failure: beta blocker therapy (ACO#31)	--	--	--	--	--	77.57	8.43	74.67	63.66	-58.13
Coronary artery disease (ACO#33)	--	--	--	--	--	71.56	63.60	55.58	71.12	-23.49
	PH [d]	PH [d]	PH [d]	PH [d]	PH [d]	Ak [e]	Ak [e]	Ak [e]	Ak [e]	Ak [e]
Getting Timely Care, Appointments, and Information (ACO #1)	77.05	73.59	76.99	75.01	-1.48	82.43	83.37	76.99	75.01	2.92
How Well Your Doctors Communicate (ACO #2)	91.17	91.38	90.62	89.73	1.10	93.56	94.62	90.62	89.73	1.95
Patients' Rating of Doctor (ACO #3)	90.71	91.08	90.03	89.31	1.09	92.57	93.07	90.03	89.31	1.22
Access to Specialists (ACO #4)	85.13	84.57	83.03	79.91	2.57	85.98	86.27	83.03	79.91	3.42
Health Promotion and Education (ACO #5)	56.21	54.71	55.68	56.00	-1.82	62.32	59.93	55.68	56.00	-2.71
Shared Decision Making (ACO #6)	68.66	66.42	72.59	73.64	-3.28	76.68	75.15	72.59	73.64	-2.58
Health Status/Functional Status (ACO #7)	71.33	69.89	69.73	70.46	-2.17	71.55	72.11	69.73	70.46	-0.17
Depression screening (ACO #18)	1.16	62.66	23.55	38.33	46.73	13.94	73.89	23.55	38.33	45.18
Colorectal cancer screening (ACO #19)	35.16	57.84	51.87	50.72	23.84	38.13	58.09	51.87	50.72	21.12
Mammography screening (ACO #20)	37.90	59.75	56.58	54.79	23.65	59.99	68.51	56.58	54.79	10.32
Diabetes poor control (ACO#27)	37.72	11.92	28.66	30.66	-27.80	23.86	16.38	28.66	30.66	-9.48
Hypertension (blood pressure control) (ACO #28)	52.72	59.25	65.34	65.22	6.66	57.60	69.98	65.34	65.22	12.51
Ischemic vascular disease control (ACO#30)	79.24	91.01	61.36	71.88	1.25	60.65	81.76	61.36	71.88	10.59
Heart failure: beta blocker therapy (ACO#31)	100.00	100.00	74.67	63.66	11.01	86.19	81.82	74.67	63.66	6.64
Coronary artery disease (ACO#33)	76.66	93.66	55.58	71.12	1.46	71.88	78.82	55.58	71.12	-8.59

Performance Measure [a]	AIM BL	AIM PY	Non-AIM BL	Non-AIM PY	DID	AIM BL	AIM PY	Non-AIM BL	Non-AIM PY	DID
	Sun [f]	Sun [f]	Sun [f]	Sun [f]	Sun [f]	PMD [g]	PMD [g]	PMD [g]	PMD [g]	PMD [g]
Getting Timely Care, Appointments, and Information (ACO #1)	78.22	76.19	80.40	79.15	-0.78	78.93	77.58	80.40	79.15	-0.10
How Well Your Doctors Communicate (ACO #2)	90.37	90.15	92.48	92.60	-0.33	92.80	91.98	92.48	92.60	-0.93
Patients' Rating of Doctor (ACO #3)	90.49	92.31	91.71	92.12	1.41	92.80	90.02	91.71	92.12	-3.18
Access to Specialists (ACO #4)	86.22	86.88	84.17	83.64	1.20	84.04	82.97	84.17	83.64	-0.54
Health Promotion and Education (ACO #5)	61.42	62.05	59.27	60.35	-0.45	60.13	63.76	59.27	60.35	2.55
Shared Decision Making (ACO #6)	77.35	72.76	74.83	75.70	-5.45	73.70	75.65	74.83	75.70	1.09
Health Status/Functional Status (ACO #7)	66.24	67.62	70.01	69.82	1.57	71.99	71.56	70.01	69.82	-0.24
Depression screening (ACO #18)	69.38	84.10	34.67	48.84	0.55	25.98	45.91	34.67	48.84	5.76
Colorectal cancer screening (ACO #19)	55.60	56.93	47.44	49.07	-0.29	47.44	53.88	47.44	49.07	4.81
Mammography screening (ACO #20)	63.44	66.94	54.39	61.72	-3.82	59.20	61.05	54.39	61.72	-5.47
Diabetes poor control (ACO#27)	17.36	13.62	29.90	22.67	3.49	20.61	24.64	29.90	22.67	11.26
Hypertension (blood pressure control) (ACO #28)	71.75	75.17	62.69	72.49	-6.38	76.60	73.91	62.69	72.49	-12.49
Ischemic vascular disease control (ACO#30)	90.00	91.41	72.37	76.92	-3.13	69.84	73.43	72.37	76.92	-0.95
Heart failure: beta blocker therapy (ACO#31)	88.56	90.00	86.77	91.38	-3.17	86.92	86.96	86.77	91.38	-4.57
Coronary artery disease (ACO#33)	81.32	75.30	73.65	78.68	-11.05	74.22	87.50	73.65	78.68	8.25

[a] Some ACO quality measures (indicated with a dash) either were not reported by the ACO or not enough beneficiaries met the denominator criteria.
[b] PC = Physician's Collaborative
[c] Ba = Baroma Healthcare International
[d] PH = Premier Healthcare
[e] Ak = Akira Health
[f] Sun = Sunshine ACO
[g] PMD = PremierMD

Appendix 6A. Annual Wellness Visit, Chronic Care Management, and Transitional Care Management Codes

Name	Code	Description	Billing Restrictions	Providers Eligible to Bill	Patient Eligibility and Other Considerations
Annual Wellness Visits (effective 1/1/11)	G0438	Annual Wellness Visit, Including Personal Prevention Plan Services (PPPS), First Visit	1) Billable only after 12 months from date of Medicare enrollment AND bene has not had IPPE or AWV within the past 12 months 2) If billed within first 12 months of Part B enrollment, will be denied per bene eligibility for IPPE (G0402, also known as the "Welcome to Medicare Visit")	MD, DO, PA, NP, CNS. Also: other medical professional including health educator, reg. dietician, nutritionist, or other licensed practitioner--under direct supervision of MD	No coinsurance or deductible; Goal: health promotion, disease detection, coordination of screening and prevention
Annual Wellness Visits (effective 1/1/11)	G0439	Annual Wellness Visit, Including Personal Prevention Plan Services (PPPS), Subsequent Visit	1) Billable only after 12 months from date of Medicare enrollment AND bene has not had IPPE or AWV within the past 12 months 2) If billed within first 12 months of Part B enrollment, will be denied per bene eligibility for IPPE (G0402)	MD, DO, PA, NP, CNS. Also: other medical professional including health educator, reg. dietician, nutritionist, or other licensed practitioner--under direct supervision of MD	No coinsurance or deductible; Goal: health promotion, disease detection, coordination of screening and prevention
Chronic Care Management (effective 1/1/15)	99490	Chronic Care Management, at least 20 minutes clinical staff time, directed by a physician or other qualified healthcare professional, per calendar month	Only 1 provider paid for CCM per calendar month; the provider can report either CCM or Complex CCM (not both) per calendar month; Assumes 15 minutes of work by billing provider per calendar month; CCM cannot be billed during same service period as: G0181/G0182 (Home care supervision/hospice) or 90951-90970 (ESRD services) or 99495/99496 (30-day transitional care management service period); CCM cannot be billed in the same calendar month as prolonged E/M services	MD, NP, PA, Certified Nurse Midwives	For patients with multiple (2 or more) chronic conditions expected to last 12 months or more
Chronic Care Management (effective 1/1/15)	99487	Complex Chronic Care Management, moderate or high complexity medical decision making, 60+ minutes of clinical staff time directed by MD or other qualified healthcare professional, per calendar month	Only 1 provider paid for CCM per calendar month; the provider can report either CCM or Complex CCM (not both) per calendar month; CCM cannot be billed during same service period as: G0181/G0182 (Home care supervision/hospice) or 90951-90970 (ESRD services) or 99495/99496 (30-day transitional care management service period); CCM cannot be billed in the same calendar month as prolonged E/M services	MD, NP, PA, Certified Nurse Midwives	For patients with multiple (2 or more) chronic conditions expected to last 12 months or more

Name	Code	Description	Billing Restrictions	Providers Eligible to Bill	Patient Eligibility and Other Considerations
Chronic Care Management (effective 1/1/15)	99489	Complex Chronic Care Management, each additional 30 minutes of clinical staff time, per calendar month	Bill in conjunction with 99487, not alone; Only 1 provider paid for CCM per calendar month; the provider can report either CCM or Complex CCM (not both) per calendar month; CCM cannot be billed during same service period as: G0181/G0182 (care plan oversight in home care or hospice) or 90951-90970 (ESRD services) or 99495/99496 (30-day transitional care management service period--see below); CCM cannot be billed in the same calendar month as prolonged E/M services	MD, NP, PA, Certified Nurse Midwives (CNM)	For patients with multiple (2 or more) chronic conditions expected to last 12 months or more
Transitional Care Management (effective 1/1/13)	99495	Transitional Care Management w/moderate medical decision complexity, face-to-face visit within 14 days of discharge	Billable 30 days from discharge (begins date of discharge + 29 days); only 1 provider can bill TCM services; can be same as discharge provider but cannot be on the same day as discharge; E/M services billed separately as applicable; No TCM allowed within 30-day global procedure period for the same provider; not billable during same period as G0181/G0182 (care plan oversight services in home care or hospice) or 90951-909710 (ESRD services) or CCM	MD, NP, PA, CNS, CNM; Billable upon discharge from: IP Acute Care Hospital, IPF, LTC facility, SNF, IRF, hospital OP observation or partial hospitalization, partial hospitalization in community MH center	
Transitional Care Management (effective 1/1/13)	99496	Transitional Care Management w/high medical decision complexity, face-to-face visit within 7 days of discharge	Billable 30 days from discharge (begins date of discharge + 29 days); only 1 provider can bill TCM services; can be same as discharge provider but cannot be on the same day as discharge; E/M services billed separately as applicable; No TCM allowed within 30-day global procedure period for the same provider; not billable during same period as G0181/G0182 (care plan oversight services in home care or hospice) or 90951-909710 (ESRD services) or CCM	See above	

Source: TCM: https://www.cms.gov/Outreach-and-Education/Medicare-Learning-Network-MLN/MLNProducts/Downloads/Transitional-Care-Management-Services-Fact-Sheet-ICN908628.pdf CCM: https://www.cms.gov/Outreach-and-Education/Medicare-Learning-Network-MLN/MLNProducts/Downloads/ChronicCareManagement.pdf AWV: http://www.cms.org/uploads/NewMedicarePreventiveServices.pdf (re the telemedicine changes 1/1/14) https://www.cms.gov/Regulations-and-Guidance/Guidance/Transmittals/downloads/R2575CP.pdf

Appendix 6B. Annual Wellness Visit, Chronic Care Management, and Transitional Care Management per 1,000 Beneficiary Years in 2015 and 2016

ACO Name	AWV 2015	AWV 2016	CCM 2015	CCM 2016	TCM 2015	TCM 2016
The Premier Healthcare Network	77	138	5	68	34	12
Akira Health	346	357	167	298	17	28
Sunshine ACO	609	676	812	1,404	68	77
PremierMD ACO	270	481	27	112	31	59
Carolina Medical Home Network Accountable Care Organization	150	293	1	122	16	11
Illinois Rural Community Care Organization	151	268	0	13	13	17
Reid ACO	341	395	9	15	19	33
Akira Health of Los Angeles	273	264	472	1,042	46	69
American Rural ACO	200	212	6	53	21	38
Access Care Oklahoma	39	182	0	1	8	9
Citrus County ACO	453	675	922	1,036	55	102
AmpliPHY of Texas ACO	416	387	14	22	11	17
AmpliPHY of Kentucky ACO	365	332	21	1	82	106
National Rural ACO 3	174	348	0	13	3	33
Avera ACO	140	187	0	8	37	28
Avera ACO II	9	102	0	5	16	32
National Rural ACO 6	129	195	1	10	1	2
Iowa Rural ACO	88	224	0	0	2	4
Illinois Rural ACO	78	137	0	2	41	49
Indiana Rural ACO II	529	552	0	3	21	32
Indiana Rural ACO	64	109	31	163	4	24
Michigan Rural ACO	453	664	3	19	21	60
Michigan Rural ACO II	325	452	0	17	1	57
New Hampshire Rural ACO	507	771	0	8	29	44
National Rural ACO 14	85	175	4	15	22	39
National Rural ACO 16	147	305	1	61	2	2
North Mississippi ACO	535	623	1	1	19	44
National Rural ACO 20	88	292	103	296	12	30
Minnesota Rural ACO	52	128	7	71	2	11
National Rural ACO 22	170	238	1	3	62	93
National Rural ACO 23	308	381	0	12	14	21
National Rural ACO 24	231	310	5	50	5	21
Aledade Kansas ACO	388	783	20	106	38	111
Aledade West Virginia ACO	476	741	14	161	74	119
Heartland Physicians ACO	401	450	0	27	32	35
Alliance ACO	286	383	44	633	30	66
Kentucky Primary Care Alliance	87	350	7	56	2	3
Aledade Mississippi ACO	462	809	37	446	16	49
Tar River Health Alliance	757	745	0	1	121	142
Affiliated ACO	432	428	39	59	1	3
California ACO	268	405	84	183	99	72
San Juan Accountable Care Organization	175	171	0	3	14	42
Rocky Mountain Accountable Care Organization	282	392	7	13	4	24

ACO Name	AWV 2015	AWV 2016	CCM 2015	CCM 2016	TCM 2015	TCM 2016
MissouriHealth+	85	156	3	5	3	3
Beacon Rural Health	487	604	1	2	86	64

Source: 2015 and 2016 Medicare administrative claims data. See **Appendix 6A** for codes used to identify visits.
Notes: AWV = Annual wellness visits; CCM = chronic care management; TCM = transitional care management.

Appendix 7A. AIM ACO Spending from Expense Reports, Q2 2015 through Q3 2017

ACO Name	AIM Spending	ACO Spending	Total Spending	Total AIM PBPM Spending	Total ACO PBPM Spending	Total PBPM Spending
The Premier Healthcare Network	$1,027,974	$217,967	$1,245,941	$4.94	$1.05	$5.99
Akira Health, Inc	$1,355,586	$5,494,391	$6,849,977	$5.85	$23.72	$29.57
Sunshine ACO	$262,949	$1,094,720	$1,357,669	$2.56	$10.66	$13.22
PremierMD ACO	$468,366	$147,069	$615,435	$3.94	$1.24	$5.17
Carolina Medical Home Network ACO	$2,114,978	$644,194	$2,759,172	$7.22	$2.20	$9.42
Illinois Rural Community Care Organization	$1,401,175	$59,875	$1,461,050	$3.26	$0.14	$3.40
Reid ACO	$1,781,717	$2,366,090	$4,147,806	$9.17	$12.18	$21.34
Akira Health of Los Angeles Inc	$859,849	$4,081,685	$4,941,534	$7.04	$33.44	$40.48
American Rural ACO	$1,265,932	$3,458,480	$4,724,412	$8.96	$24.48	$33.44
Access Care Oklahoma	$966,156	$49,800	$1,015,956	$5.70	$0.29	$6.00
Citrus County ACO	$1,106,025	$0	$1,106,025	$5.53	$0.00	$5.53
AmpliPHY of Texas ACO	$1,147,622	$71,555	$1,219,177	$7.74	$0.48	$8.22
AmpliPHY of Kentucky ACO	$309,021	$16,627	$325,648	$2.15	$0.12	$2.26
National Rural ACO 3	$1,888,330	$3,888,286	$5,776,616	$8.53	$17.57	$26.11
Avera ACO	$1,411,654	$3,564,567	$4,976,221	$6.66	$16.81	$23.47
Avera ACO II	$1,211,216	$1,966,035	$3,177,251	$5.78	$9.38	$15.15
National Rural ACO 6	$2,015,775	$8,701,008	$10,716,783	$8.27	$35.72	$43.99
Iowa Rural ACO	$1,569,424	$3,789,534	$5,358,958	$6.80	$16.42	$23.22
Illinois Rural ACO	$1,387,532	$7,457,340	$8,844,872	$4.74	$25.45	$30.19
Indiana Rural ACO II	$1,528,482	$1,199,251	$2,727,733	$12.37	$9.70	$22.07
Indiana Rural ACO	$1,440,643	$5,838,225	$7,278,868	$5.20	$21.09	$26.29
Michigan Rural ACO	$1,344,236	$2,468,234	$3,812,470	$5.44	$9.99	$15.43
Michigan Rural ACO II	$1,454,086	$2,942,657	$4,396,743	$7.25	$14.67	$21.91
New Hampshire Rural ACO	$1,533,410	$2,034,881	$3,568,291	$6.38	$8.47	$14.85
National Rural ACO 14	$1,581,044	$10,069,613	$11,650,658	$5.21	$33.20	$38.42
National Rural ACO 16	$1,396,863	$2,543,397	$3,940,260	$5.59	$10.17	$15.76
North Mississippi ACO	$2,226,746	$2,123,959	$4,350,705	$5.88	$5.61	$11.48
National Rural ACO 20	$1,590,856	$2,491,328	$4,082,185	$9.12	$14.28	$23.40
Minnesota Rural ACO	$1,301,109	$4,782,205	$6,083,314	$7.79	$28.63	$36.42
National Rural ACO 22	$1,206,410	$2,731,528	$3,937,938	$7.30	$16.52	$23.82
National Rural ACO 23	$1,747,263	$7,024,483	$8,771,746	$7.62	$30.64	$38.27
National Rural ACO 24	$1,647,391	$5,061,554	$6,708,945	$9.09	$27.93	$37.02

ACO Name	AIM Spending	ACO Spending	Total Spending	Total AIM PBPM Spending	Total ACO PBPM Spending	Total PBPM Spending
Aledade Kansas ACO	$1,190,257	$625,483	$1,815,739	$5.44	$2.86	$8.30
Aledade West Virginia ACO	$1,132,374	$459,046	$1,591,419	$6.65	$2.70	$9.35
Heartland Physicians ACO, Inc.	$1,069,370	$143,375	$1,212,745	$8.44	$1.13	$9.58
Alliance ACO	$1,263,092	$0	$1,263,092	$6.55	$0.00	$6.55
Kentucky Primary Care Alliance	$1,340,868	$125,296	$1,466,163	$9.50	$0.89	$10.39
Aledade Mississippi ACO	$1,453,710	$476,671	$1,930,381	$4.43	$1.45	$5.88
Tar River Health Alliance	$622,323	$327,925	$950,248	$3.01	$1.59	$4.60
Affiliated ACO	$1,176,303	$222,445	$1,398,748	$10.01	$1.89	$11.91
California ACO	$1,302,747	$134,656	$1,437,402	$4.03	$0.42	$4.44
San Juan Accountable Care Organization	$799,738	$592,046	$1,391,784	$5.03	$3.72	$8.75
Rocky Mountain Accountable Care Organization	$1,102,820	$1,280,443	$2,383,263	$3.74	$4.34	$8.08
MissouriHealth+	$812,494	$833,364	$1,645,859	$3.84	$3.94	$7.78
Beacon Rural Health	$1,524,881	$715,402	$2,240,283	$11.32	$5.31	$16.62

Source: AIM expense reports from Q2 2015 through Q4 2016.

Appendix 7B. Items from Non-AIM SSP Web Survey

In the fall of 2016, we fielded an electronic survey to non-AIM SSP ACOs. The survey sample frame consisted of 132 non-AIM ACOs (62 ACOs beginning SSP in 2016 and 70 ACOs beginning SSP between 2013 and 2015). The items below, from the Web survey, are used in **Chapter 7** exhibits.

10. What expenses has your ACO incurred to support participation in the Shared Savings Programs? Check all that apply:

- ❑ Clinical staff
- ❑ Care management staff
- ❑ EHR system purchase/ upgrade
- ❑ Care management software
- ❑ Risk analysis/claims analysis software
- ❑ Risk analysis/claims analysis consultant/services
- ❑ Rent/office space
- ❑ Hiring clinical management/leadership staff
- ❑ Hiring administrative management/leadership staff
- ❑ Hiring/reimbursing management company services
- ❑ Incorporated back into operating budget
- ❑ Other-- please specify _____

11. If you had received pre-paid shared savings such as in the ACO Investment Model or Advance Payment Model, in which areas would you have invested those funds? (In these Models, the funds would have been given up front and then reconciled with shared savings until fully recouped). Check all that apply:

- ❑ Clinical staff
- ❑ Care management staff
- ❑ EHR system purchase/ upgrade
- ❑ Care management software
- ❑ Risk analysis/claims analysis software
- ❑ Risk analysis/claims analysis consultant/services
- ❑ Rent/office space
- ❑ Hiring clinical management/leadership staff
- ❑ Hiring administrative management/leadership staff
- ❑ Hiring/reimbursing management company services
- ❑ Incorporated back into operating budget
- ❑ Other--please specify _____

12b. In which infrastructure improvement areas were the savings used? Check all that apply:

- ❑ Investments in clinical staff
- ❑ Investments in care management staff
- ❑ EHR system purchase/upgrade
- ❑ Care management software
- ❑ Risk analysis/claims analysis software
- ❑ Risk analysis/claims analysis consultant/services
- ❑ Rent/office space
- ❑ Hiring management/leadership staff
- ❑ Hiring/reimbursing management company services
- ❑ Incorporated back into operating budget
- ❑ Other-- please specify _____

BOLD
THINKERS
DRIVING
REAL-WORLD
IMPACT

Abt Associates
6130 Executive Boulevard
Rockville, MD 20852

abtassociates.com