LESSONS LEARNED FROM 2014 SHARED SAVINGS ACO PERFORMANCE

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ABSTRACT

In this paper, I examine the 2014 performance data of Track 1 Medicare Shared Savings Program (MSSP) Accountable Care Organizations (ACOs) and using quantitative analysis, identify several key demographic and market variables that are statistically correlated with the likelihood of “success,” i.e. generating enough savings to surpass their benchmark and receive a payout from Medicare. According to these findings, ACOs located in hospital referral regions (HRRs) with higher levels of initial spending were disproportionately likely to share in savings, most likely because their initial benchmarks would be inflated, setting a more achievable savings target. Despite predicting that ACOs in regions with lower initial healthcare quality would lead to higher rates of success for the same reason, two of my three quality variables yielded non-statistically significant results, while MSSP ACOs with readmission rates in the top decile were actually statistically correlated with lower savings, presumably due to the fact that enhanced care coordination could not reduce the services needed to care for these inherently sicker populations. Lower regional market saturation, i.e. a higher number of Medicare fee for service (FFS) beneficiaries per ACO in the same HRR, was also found to be positively correlated with increased savings, which carries with it concerning implications for the program’s future growth potential. Contrary to my original hypothesis, ACOs further in their contracts (particularly those in CY3) had an increased likelihood of achieving savings, potentially due to some combination of a steep learning curve as well as a delay in the realized effects of initial investments in preventative care and increased coordination efforts. However, the steep turnover rate of
participants who experienced losses and a benchmarking formula that naturally becomes more challenging to meet over time call into question the durability of this positive association between experience and success over time. Finally, I aimed to prove that ACOs with a higher Medicare patient population would be more invested in MSSP outcomes and thus spend more in upfront investments and increase their chances of achieving savings. However, as this payer breakdown data is not publicly available, I used Medicare-eligible proportion of the regional population as a proxy, which was ultimately not found to be a statistically significant predictor or success. I suspect this is more due to its inherent imprecision as a proxy variable and recommend required reporting and further study of payer breakdown, specifically relating to proportion of reimbursements tied to value, and its impact on achieving savings, particularly as the public and private sectors increasingly shift to a value-based reimbursement environment.

Overall, my findings suggest that the current one-size-fits-all benchmarking formula fails to adequately account for certain regional market factors and reward different types of saving, which inherently disadvantages ACOs from certain demographic and regional backgrounds from ultimately earning shared savings. This, combined with changing requirements and a drive to forcibly move Track 1 ACOs into dual-sided risk contracts while the program still yields very mixed results, severely undermines potential participants’ confidence in this voluntary program, which in turn threatens the MSSP’s overall chances of survival without major methodological changes.
List of Abbreviations

ACA……..Affordable Care Act
ACO……..Accountable care organization
APM……..Alternative payment model
CMS……..Centers for Medicare & Medicaid Services
CY……….Contract year
FFS……….Fee for service
HCC……..Hierarchical Condition Categories
HRR……..Hospital referral region
MACRA…Medicare Access and CHIP Reauthorization Act
MSR……..Minimum savings rate
MSSP……..Medicare Shared Savings Program
PY………..Performance year
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I. Introduction and Motivation for Research

ACOs have been the Centers for Medicare & Medicaid Services’ (CMS’) pinnacle effort to orchestrate savings and improve health outcomes through an increased focus on care coordination and elimination of unnecessary services. According to the agency’s website, ACOs are defined as “groups of doctors, hospitals, and other health care providers, who come together voluntarily to give coordinated high quality care to their Medicare patients” to ultimately “deliver high-quality care and spend health care dollars more wisely… [and] share in the savings it achieves for the Medicare program.”¹ These models are on the rise in both in the public and private sectors; as of December 2015, 782 total ACOs in the United States cover more than 23 million lives,² 8.9 million of which are included in one of Medicare’s 477 total ACOs.³

At the same time, early program performance yields disappointing results for Medicare ACOs. Less than half (152 out of 333) of total MSSP ACOs generated gross savings below their historical benchmarks, resulting in a combined savings of $974,704,175. The remaining 181 ACOs exceeded targets by $683,226,331, resulting in a net overall savings of just $291,477,844. And when taking into account the $806,207,621 in shared savings payments that Medicare had to dole out to the 90 ACOs that surpassed their minimum savings rates (MSRs), the MSSP yielded a $49,768,459 loss to Medicare.⁴ (Figure 1) Just 27% of all MSSP ACOs were able to generate enough savings to qualify for any shared savings payments in return. Perhaps not surprisingly, despite overall modest annual growth in the total number of participants in the program, the

¹ Accountable Care Organizations: General Information
² Muhlestein
³ New hospitals and health care providers join successful, cutting-edge federal initiative that cuts costs and puts patients at the center of their care
⁴ 2014 Shared Savings Program Accountable Care Organizations Public Use File
consistently high turnover rate of existing participants (nearly one third at the start of the 2016 performance year) raises questions about the program’s ability to endure.

Under a new proposed rule released this past January, CMS announced several proposed modifications to the program, including a new benchmarking methodology that would gradually incorporate regional FFS spending, rather than basing “savings” solely on an ACOs’ own historic spending. While the proposals under this rule make several marked improvements to the current MSR benchmarking methodology, and perhaps more importantly, demonstrate the agency’s willingness work with stakeholders to improve shortcomings of the relatively nascent program, they stop well short of fully addressing the program’s principal concerns. With the release of the proposed rule, the Agency also reaffirmed its goal to “transition the Shared Savings Program to… two-sided performance-based risk... in which ACOs share in both savings and losses.” To prematurely impose a shift to dual-sided risk when barely a quarter of current ACOs are currently seeing any shared savings would only lead to a mass exodus from the program. If the program is to have any hope of surviving, CMS first needs to refocus its efforts on achieving more promising performance and building confidence in the program. The principle way to accomplish this, of course, is to correct shortcomings of the current benchmarking methodology, hence my purpose for writing this paper. By analyzing the most recent performance data, I hope to identify several variables that are inadvertently predictors of an ACO’s likelihood to attaining savings (or lack thereof), thus providing CMS with several targeted opportunities for improving the benchmarking formula. To be clear, these modifications do not simply lower expectations on the backend to allow more ACOs to artificially achieve

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5 NAACOS response to CMS announcement of 2016 ACOs
6 Finalized Changes to the Medicare Shared Savings Program Regulations
7 Proposed Changes to the Medicare Shared Savings Program Regulations
savings. Rather, they intend to correct some of the deterrents to participation that have naturally stemmed from the current formula’s one-size-fits-all approach, which inadvertently outcasts a wide range of potential new ACOs from participating, and thus remains the single largest threat to the long-term viability of the program.

II. Institutional Background

In recent years, the American healthcare system has witnessed a concerted shift away from its traditional “fee for service” model in favor of a value-centric approach, intended to shift the focus away from volume of services performed and instead reward doctors based on the quality of care provided. To this end, the modern ACO was first codified in Section 3022 of the Affordable Care Act (ACA) and has been held as the premiere model to orchestrate savings and improved quality outcomes through an increased focus on care coordination and elimination of unnecessary medical services. On Oct. 20, 2011, CMS then issued a final rule filling in the regulatory details, including two distinct ACO programs. The Pioneer ACO Program was designed for “health care organizations and providers that are already experienced in coordinating care for patients across care settings,” while the Shared Savings ACO Program was suited for beginner ACOs forming new partnerships between existing physician practices, hospitals and other facilities. This program has lower available levels of shared savings, but also less risk as well, and as the significantly larger of the two (333 compared to just 20 pioneer ACOs in 2014), will be the focus of this report. ACOs in the MSSP must first select one of two models. In the two-sided (Track 2) model, the ACO faces both upside and downside risk, with a maximum sharing rate of 60% on either end past the minimum savings rate (MSR) or minimum loss rate (MLR). In the one-sided (Track 1) model, the ACO faces no downside risk, but their

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8 Accountable Care Organizations: General Information
potential payouts are capped at a slightly lower sharing rate of 50%. Again, given the overwhelming share of 2014 MSSP ACOs that were in Track 1 relative to Track 2 (130:3), I limit my regressions to Track 1 ACOs, given that the differing thresholds between the two tracks would affect the mathematical relationship between the independent variables and savings. I include Track 2 models in certain portions of my data analysis involving raw number counts, but clearly designate these instances.

Under Track 1, a group of physicians, hospitals, suppliers, and other health care providers collectively form a cohesive ACO for a contract period of three years, during which time they take responsibility for the overall care of a set group of “attributed” patients in return for a capacitated fee. Patients are prospectively assigned for the performance period on a preliminary basis based on if they receive a plurality of their primary care services (in terms of total allowed charges) from a physician or other provider within that ACO, which is then reevaluated one more time after the performance period has concluded. To qualify for the program, the ACO must be responsible for at least 5,000 Medicare beneficiaries.

A benchmark is established based on a risk-adjusted, weighted average of Medicare Parts A and B spending for attributed beneficiaries over a weighted three-year period directly preceding the start of the ACO contract. In order to share in those savings, an ACO must exceed a designated Minimum Savings Rate (MSR) while hitting a specified performance standard for quality of care. The MSR is based on a percentage of the ACO’s benchmark, and that percentage depends on the number of beneficiaries assigned, i.e. the size of the ACO, and ranges from a minimum of 2% for ACOs with 60,000 or more assigned beneficiaries to 3.9% for ACOs with 5,000 beneficiaries.

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9 Medicare Shared Savings Program Shared Savings and Losses and Assignment Methodology Specifications
beneficiaries. Any savings generated in excess of this MSR up to 10% of total benchmark expenditures\textsuperscript{10} are then split with Medicare at a rate of up to 50%, which will vary based on performance on those quality metrics. However, due to the Budget Control Act of 2011, these shared savings payments made to ACOs will be reduced by 2%.

III. Literature Review

Industry experts and health policy scholars assert that the underlying reason behind the less than optimal results of the MSSP and larger ACO program to date are the flawed methodologies used to determine the minimum savings rate (MSR) against which ACOs are ultimately compared to determine reduced costs. Even small, technical differences in methodology can have a major impact on benchmarks, and therefore the likelihood of success and attractiveness of the program altogether.\textsuperscript{11} For the purposes of this paper, I will focus on two major points of criticism with the shared savings methodology: 1) inadequate consideration of past and present differences in regional markets, specifically concerning Medicare spending, quality of care, and number of potential beneficiaries; and 2) a one-dimensional reward structure that naturally disincentives certain ACOs to join and remain in the program based on number of years in the MSSP and proportion of total payments tied to value.

\textit{Failure to account for regional differences in spending and quality}

Due to the fact that up until now an ACO has been compared not to its other ACO peers, but against its own historical performance, it has been suspected that ACOs in geographic areas with higher levels of initial spending and lower quality of care are inherently predisposed to succeed in achieving savings below their target benchmark. Douven et al. write that participation in the

\textsuperscript{10} Medicare Shared Savings Program Shared Savings and Losses and Assignment Methodology Specifications  
\textsuperscript{11} Bacher et al
ACO program may be “more attractive” for provider organizations with historically high per capita Medicare spending because “they have more fat to trim.”\textsuperscript{12} Similarly, McWilliams et. al. agree that variation in local spending likely cause ACOs to experience substantial savings or losses that are "unrelated to their efforts to improve efficiency in response to ACO contracts." Another study based on 2013 ACO data concluded that HRRs with one or more ACOs headquartered in them had higher total Medicare spending per beneficiary, compared to regions that did not contain an ACO headquarters,\textsuperscript{13} suggesting that ACOs are fully aware of this strategic advantage and are not surprisingly taking advantage, clustering in certain geographic regions. Multiple studies have argued that ACOs with a larger beneficiary population are inherently advantaged by the current ACO formula.\textsuperscript{14} Taking these two findings together, it begs the question of whether the level of competition in regional markets and thus the number of potential beneficiaries left for each ACO would potentially have an effect on an individual ACO’s overall propensity for success with the program, if not today perhaps tomorrow, as the program continues to expand in size and reach.

This paper sets to build upon these earlier analyses in a number of ways. First, the majority of earlier studies tend to rely on a more theoretical, mathematical interpretation of the structure of the formula itself to make their point. Reasons for this might include the relative infancy of the program itself. This paper will use actual ACO performance to test whether there is a proven, statistically correlative effect between being located in a high-spending, low-quality geographic

\textsuperscript{12} Douven et al
\textsuperscript{13} Epstein et al
\textsuperscript{14} McClellan et al
area and/or level of competition in the regional ACO market and ultimate success in achieving shared savings.

One-size-fits-all reward structure disincentives certain ACOs from participating

Douven et. al. acknowledge an "inherent trade-off" between providing high-performing ACOs without setting the standards for achieving savings so high that it discourages other organizations from participating in the program, all without bankrupting the program as a whole. Many scholars have criticized CMS for creating an MSR whose pendulum swings too far in the interest of avoiding making unnecessary payouts (avoiding a Type II error) to the point where it almost eliminates it completely, but consequently fails to award deserved bonuses to ACOs who worked hard to achieve such savings. This inherent flaw is only exasperated the longer an ACO participates in the program due to the short-sightedness of the current incentive structure. As it currently stands, ACOs benchmarks are reevaluated at the end of every three-year contract. Therefore, once an ACO achieves initial savings from its shift to a more value-centric approach, it becomes difficult to sustain continuous reductions over time. Without realistic incentives that recognize this shortcoming and reward ACOs that show continued, but perhaps more gradual improvement, or reward consistent high performers, ACOs are likely to drop out of the program altogether because they essentially hit a wall of improvement and fall short of unrealistic spending targets. Pope and Kauter similarly assert that it would be "unlikely" that ACOs are able to “consistently generate savings beyond the low single-digit percentages.”

Along those lines, ACOs with different payment structures will inherently have differing levels of incentive to participate in the program. According to a 2011 study by the Medial Group

15 Pope et al
Management Association, groups with the smallest and largest shares of capitated payments performed the best financially, while those somewhere in the middle with more of a mix of capitated and traditional fee for service payments fared far worse, experiencing lower revenues and higher costs. Specifically, the median revenue after operating costs per physician was $218,788 for multispecialty practices with no capitated payments and $227,693 for those with a majority (51% or higher) of total revenue coming from capitated payments, while that same figure for practices with 10% or less capitation was only $199,699, and even lower for practices with 11-50% capitation ($154,780). Author Dave Gans coined this mixed reimbursement model a “dead zone” for global payment, suggesting that “the best course of action may be to avoid these types of contracts or completely embrace the new payment system.” Logically speaking, this conclusion is not altogether surprising. The entire point of an ACO, or any capitated payment model, is that focusing on a patient’s entire spectrum of care from start to finish will eventually reduce costs, but this requires of course an initial up-front investment in hiring new care plan coordinators and other value-adding infrastructure processes, which are not reimbursed by the traditional fee-for-service model.\textsuperscript{16} The investment is only recouped when enough of total reimbursements are comprised of value-driven capitated payments, or else it would be more in the practice’s interest to stick to a strict fee-for-service system that does not require any such investment, rather than getting caught somewhere in the middle. One of the goals HHS itself has repeatedly asserted for the ACO program is to encourage “investing in infrastructure and processes,”\textsuperscript{17} yet the current structure of the ACO program fails to recognize these immense startup costs inherent with establishing a new ACO. For this reason, an ACO’s ability to meet or exceed its savings goals is likely to be driven by how much skin it has in the game, i.e. what

\textsuperscript{16} Gold
\textsuperscript{17} ACO Investment Model Fact Sheet
proportion of the ACO’s total revenue is paid by Medicare, and the opportunity for return on its upfront investment that would be recouped from shared savings. Pope and Kauter point out that due to up-front investments and relative inexperience with a new care delivery model, initial cost savings are not likely to be large. They suggest that it is important to "reward and encourage" even small initial savings, yet with only 90 out of the 333 2014 Shared Savings ACOs receiving any type of share in their savings, it is safe to assume that this bar is currently set too high, likely dissuading many new ACOs from joining the program.

Ultimately with this paper, I set out to build upon the more theoretical foundations of past reports to conclusively prove through regression analysis a commonly asserted negative correlation between an ACO’s ultimate ability to successfully share in savings and the duration of their contract and percentage of payments tied up in the model, i.e. the proportion of Medicare patients respective to their total patient population, which could together be taken as their motivation to succeed. In so doing, I intend to demonstrate that the current incentive formula does not incorporate enough flexibility to properly incentivize ACOs to join and remain in the program, which is all the more substantiated by the consistently modest growth of new participants and substantial turnover of exiting participants each year. Of course, this must be balanced with the overall goal of the program to generate savings, so it would have to be designed in a strategic fashion that would provide a variety of scalable incentives while not bankrupting the program.

IV. Hypotheses

Due to flaws in the current MSR methodology, ACOs with certain demographical characteristics are disproportionately likely to “succeed” in the program, defined as an ability to generate enough savings to surpass a target benchmark and receive a payout from Medicare. Specifically:
1. ACOs located in geographic regions with historically higher Medicare spending and lower healthcare quality have initial targets that are easier to improve upon, and are thus disproportionately likely to succeed in the program.

2. ACOs located in less saturated markets (i.e. more FFS beneficiaries available for each ACO in the same HRR) have a wider selection of available patients, and are thus increasingly likely to be profitable and successful in the MSSP.

3. ACOs farther along in their contracts are less likely to continue generating enough savings to surpass their MSRs and ultimately share in savings, because under the current benchmark methodology, they would struggle to consistently achieve high levels of saving over multiple years in the program.

4. ACOs located in areas with more Medicare patients per capita will have more of their overall payments tied to the MSSP, and will thus more aggressively invest in value-adding processes, thereby improving their chances of success in the program.

V. Methodological Approach

My analysis consists of an ordered logit regression in which I test all of my independent variables against my dependent variable, which has a value of -1, 0, or 1 corresponding to whether the ACO suffered losses, generating savings but did not surpass their MSR and consequently did not share in those savings, or achieved shared savings by surpassing their MSR. I have also included several control variables and weighted by ACO size in terms of number of prospectively assigned Medicare beneficiaries in order to reduce my error term. In my analysis, I first evaluate the statistical significance of each independent variable of interest to see if it is significant at the P=0.05 level. Given that ordered logit regressions yield coefficients which cannot be directly interpreted for numerical significance, I then run two types of simulations on
each independent variable that was determined to be a statistically significant predictor of success from my original regression. In my first simulation, I determined the percentage likelihood of an ACO falling into each of the three success categories given it is at the tenth and ninetieth percentiles for that given independent variable, while controlling for outside effects. For the second simulation, I essentially worked backwards and ran a separate regression for each of the three success scenarios (losses, breakeven, shared savings), which yielded a numerically meaningful coefficient for the independent variable of interest that reflects the magnitude of its effect on the original dependent success variable.

VI. Definition of Variables

This report uses MSSP ACO PY 2014 results (the most recent available), which were obtained directly from the CMS Public Use File. Regional cost and quality data was collected from a culmination of sources including CMS Geographic Variation Public Use Files, U.S. Census data, and the Dartmouth Atlas of Healthcare. (See references for additional information.)

Dependent Variables

My dependent variable of interest ("success" of PY 2014 MSSP ACOs) is an ordinal variable split into three categories: ACOs who generated losses respective to their benchmark, those who generated savings but not enough to share in those with Medicare (which I refer to throughout this paper as “breakeven” ACOs), and those who generated enough savings to surpass their benchmark and receive a share in those savings with Medicare. I assigned each a numerical value of -1, 0 or 1, respectively. As previously mentioned, in the interest of mathematical consistency these results were limited to Track 1 ACOs, which dropped the total number of data points from 333 to 330. Two ACOs located in Puerto Rico were also omitted due to the fact that they had no
corresponding HRR from which to draw several of the data points critical to my analysis. Consequently, I am left with 228 ACO data points from which to draw my results.

Independent Variables

To test my first hypothesis, I have included Medicare spending per capita to represent regional spending, as well as three separate variables to represent regional quality: annual emergency department visits per 1,000 Medicare beneficiaries, 30-day readmissions, and total number of physicians per 1,000 residents, all taken at the HRR level. Upon discovering that they were not statistically significant as continuous, interval variables, I stratified them into quartiles, quintiles, and deciles, to determine if falling into the lowest quality bracket for any of these variables was a predictor of enhanced MSSP savings to a statistically significant degree. My final variable tests the lowest decile for number of physicians, and highest decile for ER visits and readmissions. To determine degree of market saturation for my second hypothesis, I have created a market saturation variable that is equal to the number of Medicare FFS beneficiaries (in hundred thousands) divided by the total number of ACOs in that region in order to get the number of potential Medicare beneficiaries available to each ACO, assuming an even distribution. Each ACO was assigned a corresponding ordinal-level integer ranging from one to three to represent their current contract year (with three representing those ACOs who joined in 2012). Finally, I used the percentage of the local population (by HRR) that is 65 and older as a proxy for the proportion of an ACO’s total reimbursement that is comprised by Medicare in order to test my fourth hypothesis that those with a higher percentage of their reimbursements tied in the Medicare MSSP model would more aggressively implement infrastructure changes.

Earlier studies rely on regional cost and quality information from the actual ACO performance year. Because an ACO’s savings is compared to a historical benchmark based on the three years
preceding the initial performance year, this could result in up to a four-year gap for the MSSP ACOs that began their contracts in 2012, during which time this demographic data could have shifted significantly, affecting the quality of results. With this in mind, I have chosen to collect this demographic information from the actual baseline years to more accurately account for the regional cost and quality conditions when the historical baseline was determined. While given the three-year weighted average of the current baseline formula weighting three baseline years accordingly would have been ideal, it is also burdensome to calculate. Furthermore, in a recent proposed rule, CMS proposes using only the final baseline year moving forward, stating similar concerns that the weighted method did not yield significantly different numbers and was more burdensome to calculate.\textsuperscript{18} Accordingly, I have chosen to use demographic data from BY 3, i.e.; the year directly preceding the first performance year for the purpose of this study. This will range from 2011 to 2013 and will depend on the contract year of each particular ACO.

I have also controlled for several demographic variables at the beneficiary-level and ACO-level in an effort to mitigate any confounding effects they might have on the statistical relationship between my key independent variables of interest and MSSP success. First, I independently tested several beneficiary-level demographic factors, including gender, age, race, disability, and poverty and found them to be non-statistically significant over many trials. The Hierarchical Condition Categories (HCC) score, which CMS uses to risk-adjust for the MSSP and other programs, controls for these variables in addition to more than 65 other contributing risk factors. Considering this, I decided to use the regional HCC score to control for patient-level demographics in my final regression and omitted the individual beneficiary demographic variables from my final regression in the interest of avoiding multicollinearity and simplifying

\textsuperscript{18} Proposed Changes to the Medicare Shared Savings Program Regulations
my final equation. I also included several ACO-level control variables, including whether or not an ACO received any advanced payment from Medicare, the number of beneficiaries assigned to the ACO, and the Office of Management and Budget’s rural/urban determination, which ranges from one for counties in a metropolitan area with a population of 1 million or more residents to nine for “completely rural” areas with a population of less than 2,500 which are also not adjacent to any metro area. Given my small sample, these nine categories were then folded into three larger classifications based on whether they were located in a metro area, adjacent to one, or neither. Though not a central focus for this particular paper, notably more than nine in ten of all of the ACOs in this study were located in an urban setting. (Figure 2)

**Dependent Variable**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Level</th>
<th>Label</th>
<th>Description/Variable Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>“Success” of MSSP ACO</td>
<td>ACO</td>
<td>Success</td>
<td>Ordinal variable; -1 if ACO suffered losses; 0 if ACO passed benchmark but failed to meet MSR; 1 if ACO surpassed MSR to share in savings with Medicare</td>
</tr>
</tbody>
</table>

**Independent Variables of Interest**

<table>
<thead>
<tr>
<th>Variable</th>
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<th>Label</th>
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<tr>
<td>Hypothesis 1:</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Logged Medicare spending per capita</td>
<td>HRR</td>
<td>log_Medicare_spending__PC</td>
<td>Interval variable; logged Medicare spending per capita measured in dollars</td>
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<tr>
<td>High annual ER admission rate</td>
<td>HRR</td>
<td>High_ER_rate</td>
<td>Categorical variable; equal to one if in highest decile for annual ER visits per 1,000 Medicare beneficiaries for 2014 MSSP ACOs</td>
</tr>
<tr>
<td>High 30-day hospital readmissions rate</td>
<td>HRR</td>
<td>High_readd_rate</td>
<td>Categorical variable; equal to 1 if in highest decile of Medicare readmission rates for 2014 MSSP ACOs</td>
</tr>
<tr>
<td>Low number of physicians per 1,000 Medicare beneficiaries</td>
<td>HRR</td>
<td>Low_drs_per1000</td>
<td>Categorical variable; equal to 1 if in lowest decile of number of physicians (all types) per 1,000 Medicare beneficiaries for 2014 MSSP ACOs</td>
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<td>Hypothesis 2:</td>
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<td></td>
<td></td>
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<tr>
<td>Market saturation</td>
<td>HRR</td>
<td>Market_saturation</td>
<td>Interval variable; Medicare FFS beneficiaries (in 100,000s) divided by number of ACOs</td>
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<td>Hypothesis 3:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Contract year</td>
<td>ACO</td>
<td>Yr_of_Contract</td>
<td>Ordinal variable (1,2,3); represents CY of ACO in PY 2014</td>
</tr>
</tbody>
</table>
Hypothesis 4:

| Percentage of population 65 and older | HRR | per_pop_65older | Interval variable; represents percentage of population that is 65 and older (i.e. Medicare eligible) |

Control Variables:

<table>
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<th>Variable</th>
<th>Level</th>
<th>Label(s)</th>
<th>Description/Variable Type</th>
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<tr>
<td>Patient Demographics</td>
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<tr>
<td>HCC</td>
<td>HRR</td>
<td>HCC</td>
<td>Interval variable; represents regional HCC risk score</td>
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<tr>
<td>ACO Demographics</td>
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<td></td>
</tr>
<tr>
<td>ACO size</td>
<td>ACO</td>
<td>num_ben</td>
<td>Interval variable; represents number of beneficiaries prospectively assigned to ACO</td>
</tr>
<tr>
<td>Advanced payment</td>
<td>ACO</td>
<td>adv_pay</td>
<td>Categorical variable equal to 1 if ACO received advanced payment</td>
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<tr>
<td>Regional Demographics</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Urban</td>
<td>county</td>
<td>RUC</td>
<td>Ordinal variable; ranges from 1 to 3 representing OMB’s classification as a metro, adjacent to metro, or neither</td>
</tr>
</tbody>
</table>

VII. Results: Data Analysis, Shortcomings and Opportunities for Further Research

_Hypothesis 1_

For my first hypothesis, I aimed to prove that historically high Medicare spending and low healthcare quality (i.e. high hospital emergency room admissions, high 30-day readmissions and a low number of physicians per 1,000 beneficiaries) were predictors of greater success in the MSSP, due to inflated initial benchmarks. My first and third quality variables (high ER admission rate and low number of physicians) were not statistically significant and did not allow me to reject my null hypothesis that ER admission rate and number of physicians per capita are predictors of an ACO’s success (or failure). Concerning the number of available physicians, the most salient explanation behind the lack of its statistical significance is that nearly 93% of 2014 MSSP ACOs are located in a region classified as urban, and consequentially lack of access to available physicians is likely not a major concern and thus does not play a major role in distinguishing between ACOs. However, availability of physicians would be an interesting
element to consider in future research that specifically seeks to study the effects of geographic and population variables on an ACO’s ability to achieve savings.

Logged Medicare spending per capita was found to be highly statistically significant with a P-value of 0.004 and a positive, large coefficient (in relation to other variables), suggesting that higher historic Medicare spending is indeed positively associated with an increased likelihood for savings in the MSSP, as expected. Specifically, the average Medicare per capita spending in the final baseline year for ACOs who ultimately achieved shared savings was $9,778, compared to $9,354 for breakeven ACOs, and $9,228 for ACOs who experienced losses. (Figure 4) My simulation observing the difference between ACOS in the tenth and the ninetieth percentiles adds further credence to this relationship. An ACO at the tenth percentile for logged Medicare spending per capita for instance would be five times more likely to suffer losses as they would be to generate shared savings, as well as two times more likely to suffer losses and 3.5 times less likely to generate shared savings than an ACO at the ninetieth percentile. (Figure 5) This statistically significant, positive correlation between Medicare spending in the final benchmark year and increased propensity for savings relative to a spending target suggests that the current benchmarking formula does not aptly account for baseline FFS regional spending and thus disincentives practices and hospitals located in regions with generally lower Medicare spending from participating in an ACO.

Readmission rate as a continuous variable was not a statistically significant indicator of shared savings success, but as a binary variable used to account for a readmission rate in the top decile of all 2014 MSSP ACOs, “high readmission rate” was a highly statistically significant predictor of failure, with a P value of 0.001. (Figure 3) These findings suggest that while small differences in readmission rates that fall more or less along the normal distribution curve do not affect an
ACO’s overall chances of success in the MSSP, if regional readmission rates are significantly high, they became a heavy burden on an ACO’s propensity for success. An ACO with a “high” readmission rate was nearly eight times more likely to end up with losses than shared savings, compared to a ratio of approximately 3:2 losses relative to savings for all other ACOs. (*Figure 6*) ACOs who suffered losses also had an average readmission rate that was over twice as high as ACOs who achieved any sort of savings (41% compared to roughly 19%). (*Figure 4*)

Notably, these findings contradict my original hypothesis that higher readmission rates would actually improve an ACO’s chances at success due to the fact that they would have a higher bar from which to draw savings. There could be a few explanations for this. First, when caring for truly sick patients, there is only so much difference that additional medical coordination can make. In other words, taking on essentially the top 10% of the sickest population could mean simply caring for patients with little reasonable likelihood for reducing medically necessary services, and thereby has an inherently limited opportunity for cost savings. There is also the concern of underlying behavioral or demographic characteristics of the patient population, such as lack of education or prescription adherence, that are often difficult to reverse. More research specifically into this area of how such patient demographics intersect and could possibly impede the care coordination efforts of value-based reimbursement models could prove valuable, especially considering it is often these demographic areas that have high healthcare costs per capita and are thus ideal targets for new ACOs and other value-based initiatives. Alternatively, it could simply take a bit longer for the effects of the ACO’s coordination efforts to be fully realized, which can only be revealed in time with additional research. Most likely though, the truth lies somewhere in the middle, with some combination of these explanations.
**Hypothesis 2**

With a statistical significance of $P=0.000$, my market saturation variable (equal to the number of FFS beneficiaries divided by the total number of ACOs in the HRR) proved to be the most statistically significant predictor of MSSP success. Its coefficient relative to success was both positive and reasonably large in magnitude in respect to the other variables. On average, successful 2014 ACOs had approximately 12,600 more Medicare beneficiaries available to each ACO in their HRR than either of the other two categories. *(Figure 4)* Furthermore, an ACO at the ninetieth percentile (126,722 beneficiaries per ACO in the HRR) would be nearly 17% less likely to suffer losses as an ACO at the 10th percentile (28,763 beneficiaries per ACO in the HRR), as well as nearly 14% more likely to share in savings with Medicare. *(Figure 5)* As the MSSP continues to expand, market saturation will become an increasingly important area for additional research, especially as ACOs overwhelmingly seem to converge in certain regions of this country, and particularly in the same densely populated metropolitan areas.  

**Hypothesis 3**

Contrary to my original hypothesis, both ordinal contract year variables had a statistically significant, positive relationship with success, with the third contract year slightly more statistically significant at 0.001. The raw data supports this; nearly half (43 out of 90) of the total MSSP ACOs (including two Track 2 ACOs) that earned shared savings were in their third contract year, followed by 26 in their second contract year, and 21 in their first. *(Figure 7)* The number of ACOs who experienced losses similarly drops with each additional year of experience in the program, from 62 to 46, to 44 for ACOs in their third contract year, but this still represents an over 40% loss rate for the most experienced ACOs. *(Figures 7&8)* According to my

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19 Based on 2016 Medicare Shared Savings Program Accountable Care Organizations – Map
simulation of predicted probabilities, ACOs in their very first contract year are 13.5% more likely to suffer losses than ACOs with one additional year of experience in the program, and nearly 16% more likely than ACOs with two. The likelihood of surpassing one’s MSR similarly jumps over 10% between contract years one and two, and receives another, though more moderate, boost of 2.38% between contract years two and three. (*Figure 9*)

It appears based on these results that ACOs farther along in their first agreement period benefitted from more experience in the program, which will become an important area of additional study as the first ACOs transition to subsequent agreement periods that come with increased risk. However, this positive association suffers from two important biases. First, there was a large turnover in participants from year to year, and the poorest performers would have naturally been the ones to self-select out of the program. Additionally, this first class of ACOs inherently suffers from selection bias in that only the most innovative healthcare systems would have the confidence to take the plunge and serve as the beta testers of this brand new program. These beg the question; if you take the star students of the industry who are the best performing and most experienced in the MSSP, and 40% still suffer losses after three years in the program, what does that have to say about future cohorts of ACOs?

*Hypothesis 4*

Percent of HRR population 65 and older was neither statistically significant, nor high in magnitude, and did not allow me to reject my null hypothesis that a beneficiary mix with a higher proportion of Medicare patients is not correlated with an increased propensity for success in the program. This variable was chosen to serve as a proxy for estimating the proportion of an ACO’s total reimbursements that is tied to MSSP payments, given that this type of information is
not publicly available. Given its nature as a proxy, it was thus naturally limited in its correlative and explanatory power and which likely contributes to the explanation behind its lack of statistical significance with success. Furthermore, MSSP represents only one payer for these large and diverse medical systems. A recent study by McKesson Health Solutions estimates that 90% of payers and 81% of hospitals are deploying some mix of value-based reimbursement combined with FFS.\textsuperscript{20} As both the private and public payers shift increasingly towards value-based reimbursement, the incentivizing power of such payments should be viewed in the context of an ACO or health system’s total reimbursement package across all payers. Studying solely the proportion of Medicare patients that would be covered by the MSSP thus does not tell the whole story. This subject of how the proportion of payments tied to value affects a system’s motivation to invest in care coordination and infrastructure investments to reduce services and spending will become an increasingly interesting and important area of focus for future study as the health sector continues its gradual shift towards alternative payment models (APMs) and a more value focused environment. However, the current lack of transparency and sharing of payment information across ACOs and APMs remains a major roadblock to this sort of endeavor.

**VIII. General Limitations**

The MSSP is still in its relative infancy, with this latest round of 2014 performance data still in the program’s introductory agreement period. This, of course, strictly limits my ability to establish trends over longer periods of time, particularly regarding my second and third hypotheses which concern an ACO’s ability to continuously generate savings over time as it chases increasingly challenging benchmarks without getting credit for shared savings and compete in an increasingly competitive market as more ACOs join the program. The greatest

\textsuperscript{20} Nace
statistical limitation of my results, however, remains the limited size of my sample, which was
unfortunately unavoidable given the number of MSSP ACOs in the 2014 performance year. As
the program continues to expand both in terms of size and duration, future studies will benefit in
a higher potential statistical significance due to the larger sample size. However, the regulatory
changes currently in proposed form at the time this paper was written would have a major impact
on the structure of the benchmarking formula, and would consequentially restrict the
applicability of studies based on the current (soon to be former) benchmark after this change is
implemented, as well as inhibit the ability of future researchers to establish meaningful statistical
trends over longer periods of time that span this policy change (though studying the impact of
pre- and post- said policy change could make for an interesting time series study in itself).

**IX. Future Policy Implications and Recommendations**

**Hypothesis 1**

In its newest proposed rule, CMS announced plans to drastically alter the benchmarking
methodology by gradually incorporating regional FFS spending to account for as much as 70%
of the total savings benchmark by the third agreement period. While this will help to address the
issue of ACOs continuing to achieve savings over time, unfortunately, it does nothing to
dissuade the concern that ACOs in certain geographic regions will be inherently disadvantaged,
and in fact, may even exacerbate the discrepancy. Based on the results of this paper, we see that
under the existing benchmarking formula, low regional Medicare FFS spending already acts as a
hindrance on an ACO’s ability to succeed, even though the benchmark is based entirely on an
individual ACO’s own past spending and has no separate, distinct Medicare FFS element. Under
the proposed methodology, the disadvantage felt by ACOs located low FFS spending regions
would be even more pronounced given the simple fact that it would now formally account for a
substantial and eventually, majority portion of the overall benchmark score. According to an independent analysis by a coalition of industry groups, 66% of ACOs would have their benchmarks affected by a margin of 2% or more from the initial 35% phase-in alone. Furthermore, under the current formula, spending dollars were “trended forward” at a national rate, whereas the proposed new formula would compare ACO spending to FFS spending strictly at the regional level, which will only amplify regional discrepancies in spending and make it even more difficult for ACOs in low FFS spending regions to effectively compete for savings in the program. We could start to see entire ACO blackout regions where the cost to enter and succeed in the program is simply too high.

In terms of the negative correlation between Medicare readmission rate and ultimate success, ACOs who take on Medicare’s sickest patients are being disproportionately disadvantaged when it comes to succeeding in the program, which could have potentially dangerous implications for the sustainability of the MSSP, given it is voluntary. How can a program built on the principle of achieving savings to Medicare by improving quality of care and reducing unnecessary service utilization achieve its goal when its inherent design incentivizes ACO participants to turn away the sickest patients? If the current benchmarking methodology continues as-is, ACOs may start to turn away the sickest patients so as not to hamper their ability to reign-in spending, which would run counter spirit to the goals of the program.

**Hypothesis 2**

As the most statistically significant of my findings, market saturation paints a concerning picture about the future of the current MSSP as it seeks to expand and market competition inevitably

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21 ACO coalition letter
becomes more intense. The statistically significant, negative correlation between the number of available Medicare beneficiaries per ACO in a regional market unearthed in this paper identifies a critical tragedy of the commons scenario in which there may be a limit to how many ACOs can reasonably compete in the same regional market before their increasingly marginalized share begins to threaten their ability to succeed in the program, particularly in already dense markets. This would cause ACOs to drop out of the market until market balance is restored, thereby instituting a de facto ceiling on the market. The current MSR formula for Track 1 MSSP ACOs, which operates on a sliding scale where ACOs with more assigned beneficiaries (i.e. those larger in size) have a smaller percentage-based benchmark, only compounds this monopolizing effect. In essence, smaller ACOs have the chips stacked against them in two ways; 1) they must compete against larger competitors for a share in an already competitive regional market, and 2) they must attain a higher level of proportional savings in order to share in them. CMS hoped that by incorporating an element of comparison to ongoing regional FFS spending into the proposed new benchmarking formula, it would help to mitigate some of these effects and give all ACOs a better footing to continue achieving savings well into the future. However, under this methodology, ACO beneficiaries would essentially be double counted, both in the ACO’s own assigned beneficiary pool, and also toward the regional FFS population. First and foremost, this makes no intuitive mathematical sense, as it prohibits any sort of real apples to oranges comparison between the ACO’s spending and unadulterated FFS spending. This in turn cuts into the true differential between FFS spending and an ACO’s spending, which means ACOs would not receive the full credit they are due for maintaining spending levels consistently below traditional FFS Medicare. It also completely fails to address both the MSR and market distortive effects that disadvantage smaller ACOs.
**Hypothesis 3**

Given my results of a statistically significant, positive correlation between contract year and ability to succeed, it appears that the benefit of experience in the program seems to outweigh the methodological disadvantage of a benchmark formula that does not account for past savings. However, I would suspect that the clock on this will soon run out as participants remain in the program year after year and the opportunity to capitalize on initial cost-cutting measures eventually runs out. CMS formally considered incorporating past savings into subsequent benchmarks to account for this shortcoming, but ultimately left this out of their final proposal, citing that incorporating ongoing regional FFS spending would help to account for naturally depreciating savings. While it is true that this new formula is an improvement in that it provides an avenue for well performing ACOs to continue achieving shared savings, it still fails to account for past savings, and thus misses an opportunity to reward ACOs for more gradual, cumulative improvement over time. In 2014, more ACOs fell into this breakeven category of achieving savings, but not enough to surpass their MSR and share in these savings with Medicare (91 total including 1 Track 2 ACO) than those that actually managed to achieve shared savings. (Figure 7) Of ACOs in their third and final contract year in their first agreement period, more than one in five fell into this breakeven category. By expanding the benchmark methodology to account for past savings and thus reward more gradual savings over time, CMS would inject meaningful incentive into the program for a large segment of ACOs that would otherwise drop out, and it would do so without incurring a huge cost, as these shared savings payments would not be paid out every year. The underlying issue once again is lack of flexibility in the reward structure, which has continued to plague the program since its inception.
While the number of ACOs experiencing losses and achieving shared savings are gradually dropping and rising respectively with each additional year in the program under their belt, the key word here is gradually. The 40% failure rate even for ACOs in their third and final contract year in the first agreement period is hardly a promising statistic with which to push forward into dual-sided risk for second and subsequent agreement periods. Consequently, in its June 2015 final rule, CMS afforded ACOs the opportunity to remain in Track 1 for an additional three-year agreement period. Building in this additional time for new ACOs to establish their footing in the program and allowing time for the effects of their care coordination efforts to be fully realized before advancing to dual-sided risk contracts was a welcome sigh of relief for the 44 CY3 ACOs that experienced losses in PY14 and would have otherwise almost certainly dropped out of the program. However, over the course of their two years in the program, the percentage of ACOs who achieved losses only fell by a total of 12%, and that reduction depreciated annually from 7% to 5%. (Figure 8) This trend suggests that even with another three-year agreement period under Track 1, under this current formula a substantial portion of ACOs would still struggle to meet their benchmarks and almost certainly exit the program at the close of their second agreement period when they would be forced to move into dual-sided risk models. A voluntary program simply cannot succeed when 3 to 4 out of every ten ACOs are failing. Additional time in single sided risk models will certainly help to attract and retain new ACOs, but CMS cannot expect experience alone to unilaterally address high failure rates when the savings methodology itself is inherently flawed.

**Hypothesis 4**

Despite not finding proportion of Medicare eligible in the regional population to a statistically

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22 Finalized Changes to the Medicare Shared Savings Program Regulations
significant predictor of shared savings in my model, for the reasons cited earlier, I continue to maintain the importance of considering the proportion of an ACO’s total reimbursements (including public and private payers) that are tied to value when it comes to future policy making. As Medicare sets out to achieve its aggressive goal of tying 50% of Medicare payments to value, the implications that this breakdown will have on an ACO’s motivation to invest in care coordination and infrastructure investments are too important for Medicare to disregard. Unfortunately, up to this point there has been no systematic effort to collect this important data, making it impossible to conduct any sort of meaningful analysis. As such, I propose that in the immediate future, Medicare require each ACO (and preferably each APM in general) to report the percentage of payments that come from each payer, and what proportion of these payments are tied to value in some way. The reporting burden on each ACO would be minimal (and could be mitigated further by requiring ACOs only report payers that represent a certain minimum percentage of their overall payments) and the information gathered could lend instrumental insight into the future of the ACO program.

After this initial phase is completed, in line with my other recommendations, I would encourage CMS to incorporate additional flexibility into the shared savings structure that would account for not just the total number of Medicare beneficiaries that are paid under the MSSP, but the proportion of an ACO’s overall reimbursements that are tied to value across its public and private payers. This will help to account for discrepancies in value-based incentive between ACOs who may be similar in size in terms of their assigned Medicare beneficiary population under the MSSP, but differ greatly in terms of additional value-based reimbursement streams. Importantly, this sort of accommodation could be easily implemented in budget-neutral fashion; Medicare could take advantage of the additional value-based incentives provided by other payers
by skimming a small amount off of the total MSSP shared savings returned, and use those additional funds to sweeten the pot for ACOs who do not have these same supplementary value-based revenue sources. The small losses incurred by ACOs with multiple value-based revenue streams would be very unlikely to cause them to drop out of the MSSP, particularly as these are the very ACOs that are more heavily invested in value-based payment models to begin with, but it could be just the extra motivation that new, undecided ACOs need to participate. By implementing a more multifaceted incentive structure that leverages additional incentives already built into the market due to the private sector, Medicare stands to attract new ACOs to the program without spending an extra penny. It’s a rare win-win scenario.

X. Final Thoughts: MSSP Outlook in Context of an Evolving Medicare Environment

As a voluntary program, the rigid structure of the current benchmarking formula is dooming the MSSP to at best, plateau, at worst, fail outright. No optional program can endure if it does not have a healthy influx of new willing participants, and the only way to accomplish this is through a carefully designed, multifaceted pathway to success that will attract various types of new and existing ACOs that come from a wide array of demographic and regional backgrounds. CMS has taken an important step in the right direction by introducing a new element to the benchmarking formula (i.e. ongoing regional spending), but the one-size-fits-all formula still misses the mark and falls well short of the changes necessary to transform this program into a standard bearer of new innovative, cost-saving payment models for which the current Administration is only increasing its appetite.

In a self-proclaimed “historic announcement,” Health and Human Services Secretary Sylvia Matthews Burwell declared her intentions to expand the ACO program, setting a goal of tying 50% of traditional FFS Medicare payments to new “alternative payment models,” (APMS)
including certain types of ACOs, by the end of 2018. The Medicare Access and CHIP Reauthorization Act (MACRA), passed into law on April 16, 2015, helped to forward this goal by offering a number of incentives for the development of new APMs, including a permanent exclusion from participating in burdensome federal quality reporting programs, a 5% annual lump-sum bonus of total Medicare reimbursements from 2019 through 2023, and a 0.75% annual payment update starting in 2026 moving forward, which is 0.5% higher than for practices not participating in an APM. The big question the industry is collectively holding its breath to find out remains whether or not CMS will designate Shared Savings ACOs as one of these new qualifying APMs under MACRA.

Given the evolving future of ACOs and mixed results to date, practices and hospitals across the country are finding it difficult to justify major infrastructure investments and take the leap to join or start an ACO. In addition to adopting the proposals forwarded in this paper to expand the MSSP’s potential reach to a wider base of possible participants, officially designating MSSP ACOs as qualified APMs would lend the MSSP the credibility it desperately needs. CMS has cited concerns that Track 1 MSSP ACOs would not meet the “nominal risk” requirement for APMs under MACRA. Data suggests otherwise. According to a 2014 study, the average startup costs including investments in new interoperable technologies, necessary infrastructure and additional staffing incurred by each ACO in their first year of operation was a staggering $2 million, and reached as high as $6.7 million, proving that Track 1 MSSP ACOs take on much more than “nominal risk” in the form of substantial upfront investments incurred in forming an

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23 Better, smarter, healthier: In historic announcement, HHS sets clear goals and timeline for shifting Medicare reimbursements from volume to value
24 Medicare Physician Payment Reform
25 National ACO Study
ACO, even if the Track 1 reimbursement model itself does not feature downside performance-based financial risk. Further, CMS itself counted MSSP ACOs as APMs when it specifically mentioned the program by name as a vital “tool” in reaching its goal of tying 30% of Medicare payments to quality via alternative payment models “nearly a year ahead of schedule.” CMS should remain consistent with the past precedent the agency itself has set and officially designate MSSP ACOs as qualified APMs for the purposes of MACRA.

Today, MSSP ACOs comprise more than nine in ten of Medicare’s 477 total ACOs. The simple truth is that if CMS does not designate MSSP ACOs as qualifying APMs under MACRA, it would take the wind out of the sails of the entire ACO program, and serve as a major setback to the value-based movement as a whole. If CMS is truly interested in seeing the MSSP endure long into the future and counting it and its 7.7 million Medicare FFS beneficiaries towards Medicare reimbursements tied to value, it is paramount the agency instill confidence in the program’s future sustainability by 1) recognizing MSSP ACOs as qualified APMs under MACRA, 2) accounting for unintended discrepancies in an ACO’s ability to succeed due to regional factors beyond their control, and 3) expanding the current one-dimensional definition of “savings” to recognize a more diverse group of ACOs who have worked hard to achieve savings in a variety of ways, whether it is respective to their region, the nation as a whole, or their own past spending more gradually over time.

26 HHS reaches goal of tying 30 percent of Medicare payments to quality ahead of schedule
27 Medicare Shared Savings Program News and Updates
28 Better, smarter, healthier: In historic announcement, HHS sets clear goals and timeline for shifting Medicare reimbursements from volume to value
29 CMS Welcomes New Medicare Shared Savings Program (Shared Savings Program) Participants
### XI. Appendix

**Figure 1: Gross Differential from Target Savings by Contract Year**

**ACOs in Contract Year 1**  
(119 Total ACOs; 0 Track 2 models)

<table>
<thead>
<tr>
<th></th>
<th>All ACOs</th>
<th>Track 1 ACOs Only</th>
</tr>
</thead>
<tbody>
<tr>
<td>Benchmark – actual spending (savings/losses)</td>
<td>$4,786,899</td>
<td>$4,786,899</td>
</tr>
<tr>
<td>Shared savings payouts to ACOs who met MSR</td>
<td>$67,880,698</td>
<td>$67,880,698</td>
</tr>
<tr>
<td>Net savings/losses to Medicare</td>
<td>-$63,093,799</td>
<td>-$63,093,799</td>
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**ACOs in Contract Year 2**  
(103 Total ACOs; Includes 1 Track 2 model)

<table>
<thead>
<tr>
<th></th>
<th>All ACOs</th>
<th>Track 1 ACOs Only</th>
</tr>
</thead>
<tbody>
<tr>
<td>Benchmark – actual spending (savings/losses)</td>
<td>-$7,380,223</td>
<td>-$9,144,591</td>
</tr>
<tr>
<td>Shared savings payouts to ACOs who met MSR</td>
<td>$94,685,352</td>
<td>$94,685,352</td>
</tr>
<tr>
<td>Net savings/losses to Medicare</td>
<td>-$102,065,575</td>
<td>-$103,829,943</td>
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</tbody>
</table>

**ACOs in Contract Year 3**  
(111 Total ACOs; Includes 2 Track 2 models)

<table>
<thead>
<tr>
<th></th>
<th>All ACOs</th>
<th>Track 1 ACOs Only</th>
</tr>
</thead>
<tbody>
<tr>
<td>Benchmark – actual spending (savings/losses)</td>
<td>$294,071,169</td>
<td>$276,612,491</td>
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<tr>
<td>Shared savings payouts to ACOs who met MSR</td>
<td>$178,680,253</td>
<td>$169,087,138</td>
</tr>
<tr>
<td>Net savings/losses to Medicare</td>
<td>$115,390,916</td>
<td>$107,525,353</td>
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</table>

**Total 2014 ACOs**  
(333 Total ACOs; Includes 3 Track 2 models)

<table>
<thead>
<tr>
<th></th>
<th>All ACOs</th>
<th>Track 1 ACOs Only</th>
</tr>
</thead>
<tbody>
<tr>
<td>Benchmark – actual spending (savings/losses)</td>
<td>$291,477,845</td>
<td>$272,254,799</td>
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<tr>
<td>Shared savings payouts to ACOs who met MSR</td>
<td>$341,246,303</td>
<td>$331,653,188</td>
</tr>
<tr>
<td>Net savings/losses to Medicare</td>
<td>-$49,768,458</td>
<td>-$59,398,389</td>
</tr>
</tbody>
</table>
Figure 2: Number of ACOs in Urban, Suburban, and Rural Regions

<table>
<thead>
<tr>
<th>Region</th>
<th>Number of T1 MSSP ACOs</th>
<th>Percentage of T1 MSSP ACOs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Urban</td>
<td>304</td>
<td>92.68%</td>
</tr>
<tr>
<td>Suburban</td>
<td>18</td>
<td>5.49%</td>
</tr>
<tr>
<td>Rural</td>
<td>6</td>
<td>1.83%</td>
</tr>
</tbody>
</table>

Urban.........RUCs 1-3.........“metro area”
Suburban……..RUCs 4,6,8……..“adjacent to a metro area”
Rural..........RUCs 5,7,9……..“not adjacent to a metro area”

Figure 3: Final Results: Coefficients and Probabilities from Ordered Logit Equation

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Stat sig at 0.05 level?</th>
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</thead>
<tbody>
<tr>
<td>Log_Medicare_spending__PC</td>
<td>4.34061</td>
<td>Yes (0.004)</td>
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<tr>
<td>High_ER_rate</td>
<td>-0.1461262</td>
<td>No</td>
</tr>
<tr>
<td>High_readd_rate</td>
<td>-1.634431</td>
<td>Yes (0.001)</td>
</tr>
<tr>
<td>Low_drs_per1000</td>
<td>0.2690679</td>
<td>No</td>
</tr>
<tr>
<td>Market_saturation</td>
<td>0.8096026</td>
<td>Yes (0.000)</td>
</tr>
<tr>
<td>i.Yr_of_Contract2</td>
<td>0.6183991</td>
<td>Yes (0.043)</td>
</tr>
<tr>
<td>i.Yr_of_Contract3</td>
<td>0.745674</td>
<td>Yes (0.001)</td>
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<tr>
<td>per_pop_65older</td>
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Figure 4: Average Values of Certain Continuous Variables for Each Success Category

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<thead>
<tr>
<th>Variable</th>
<th>Success= -1 (n=152)</th>
<th>Success= 0 (n=89)</th>
<th>Success= 1 (n=87)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medicare_spending__PC</td>
<td>$9,228</td>
<td>$9,354</td>
<td>$9,778</td>
</tr>
<tr>
<td>Readd_Rate</td>
<td>41.1%</td>
<td>19.1%</td>
<td>19.2%</td>
</tr>
<tr>
<td>Market_saturation</td>
<td>0.6865</td>
<td>0.6700</td>
<td>0.8124</td>
</tr>
</tbody>
</table>

Figure 5: Predicted Probability of Success Distribution for 10th and 90th Percentile

<table>
<thead>
<tr>
<th>10th Percentile</th>
<th>90th Percentile</th>
</tr>
</thead>
<tbody>
<tr>
<td>Losses</td>
<td>Breakeven</td>
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<tr>
<td>Log Medicare Spending PC</td>
<td>69.00%</td>
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<tr>
<td>Market Saturation</td>
<td>55.34%</td>
</tr>
</tbody>
</table>

Figure 6: Predicted Probability of Success Distribution by Readmission Rate

<table>
<thead>
<tr>
<th></th>
<th>Losses</th>
<th>Breakeven</th>
<th>Shared Savings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Readmission Rate in Top Decile</td>
<td>76.07%</td>
<td>14.26%</td>
<td>9.67%</td>
</tr>
<tr>
<td>All Other ACOs</td>
<td>44.88%</td>
<td>24.67%</td>
<td>30.45%</td>
</tr>
</tbody>
</table>
**Figure 7: ACOs in Each Success Category by Contract Year (Gross Number)**

<table>
<thead>
<tr>
<th></th>
<th>Losses</th>
<th>“Breakeven”</th>
<th>Shared Savings</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contract Year 1</td>
<td>62</td>
<td>36</td>
<td>21</td>
<td>119</td>
</tr>
<tr>
<td>Contract Year 2</td>
<td>46</td>
<td>30 (31)*</td>
<td>26</td>
<td>102 (103)</td>
</tr>
<tr>
<td>Contract Year 3</td>
<td>44</td>
<td>24</td>
<td>41 (43)*</td>
<td>109 (111)</td>
</tr>
<tr>
<td>Total</td>
<td>152</td>
<td>90 (91)*</td>
<td>88 (90)*</td>
<td>330 (333)</td>
</tr>
</tbody>
</table>

(*) designates total including Track 2 ACOs

**Figure 8: ACOs in Each Success Category by Contract Year (Percentage)**

<table>
<thead>
<tr>
<th></th>
<th>Losses</th>
<th>“Breakeven”</th>
<th>Shared Savings</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contract Year 1</td>
<td>52.1% (52.1%)</td>
<td>30.25% (30.25%)</td>
<td>17.65% (17.65%)</td>
<td></td>
</tr>
<tr>
<td>Contract Year 2</td>
<td>45.1% (44.66%)</td>
<td>29.41% (30.1%)</td>
<td>25.49% (25.24%)</td>
<td></td>
</tr>
<tr>
<td>Contract Year 3</td>
<td>40.37% (39.64%)</td>
<td>22.02% (21.62%)</td>
<td>37.61% (38.74%)</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>46.06% (45.65%)</td>
<td>27.27% (27.33%)</td>
<td>26.67% (27.03%)</td>
<td></td>
</tr>
</tbody>
</table>

( ) designates total including Track 2 ACOs

**Figure 9: Predicted Probability of Success Distribution by Contract Year**

<table>
<thead>
<tr>
<th></th>
<th>Losses</th>
<th>Breakeven</th>
<th>Shared Savings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contract Year 1</td>
<td>57.36%</td>
<td>22.60%</td>
<td>20.04%</td>
</tr>
<tr>
<td>Contract Year 2</td>
<td>44.21%</td>
<td>25.58%</td>
<td>30.21%</td>
</tr>
<tr>
<td>Contract Year 3</td>
<td>41.55%</td>
<td>25.85%</td>
<td>32.59%</td>
</tr>
</tbody>
</table>
XII. Works Cited


“HHS reaches goal of tying 30 percent of Medicare payments to quality ahead of schedule.” Department of Health and Human Services Press Office. 3.3.2016. Web.

“Joint Comments on ACO Benchmarking Rule.” Multiple authors. mgma.org. 3.25.16. Web.

McClellan, Mark; Kocot, Lawrence; White, Ross. Early Evidence on Medicare ACOs and Next Steps for the Medicare ACO Program.” Health Affairs. 1.22.15. Web.


Muhlestein, David. “Growth And Dispersion Of Accountable Care Organizations In 2015.” Health Affairs Blog. 3.31.15. Web.


“New hospitals and health care providers join successful, cutting-edge federal initiative that cuts costs and puts patients at the center of their care.” Centers for Medicare & Medicaid Services Newsroom. 1.11.16. Web.

“Percent urban and rural in 2010 by state and county.” U.S. Census Bureau. Web.


