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Medicaid Managed Care: Efficiency, Medical Loss Ratio, and Quality of Care

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The recent final rule on Medicaid managed care establishes the minimum medical loss ratio (MLR) requirement for Medicaid managed care and contains several provisions to strengthen delivery and payment reforms and improve efficiency and quality of care. Accordingly, this research examines the quality of Medicaid managed care and the effect of MLR and efficiency. The results show that, medical services efficiency has an insignificant (but negative) effect on the quality of care, which indicates that there may be room to improve medical services efficiency without significantly reducing the quality of care. The MLR does have a significantly positive effect on the aggregate quality ratings, however the magnitude of this effect is very small. This indicates that a minimum MLR requirement of 80% or 85% does not make a large difference on quality ratings.

1. INTRODUCTION

Amendments to the Social Security Act (Pub.L. 89–97, 79 Stat. 286, Title XIX) in 1965 authorized the creation of two important programs, Medicare and Medicaid.¹ Medicaid programs, designed to provide health coverage for low-income individuals, are available in all states, the District of Columbia, and the U.S. territories. Medicaid is the largest public health insurance program in the United States, and is more heterogeneous in terms of membership than Medicare or commercial programs. According to a December 2018 report of the Centers for Medicare and Medicaid Services (CMS) (CMS 2018a), 65.9 million individuals were enrolled in Medicaid (Title XIX),² including eligible low-income adults, children, pregnant women, elderly adults, and people with disabilities. Beginning in 2014, the Affordable Care Act (ACA) provides states the authority to expand Medicaid eligibility to individuals under age 65 years in families with incomes below 138 percent of the federal poverty level (FPL).

Medicaid has undergone many changes and modifications over the last 50+ years. Buchmueller, Ham, and Shore-Sheppard (2016) provide a comprehensive review of the history and structure of Medicaid. Rudowitz, Garfield, and Hinton (2019) present many important features and facts concerning Medicaid. The Medicaid program is administered by states according to

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¹Quality measures of health plans generally consist of two types of measures: measures on patient experience/satisfaction, and clinical measures including health outcome measures (National Committee for Quality Assurance [NCQA] 2018; Centers for Medicare & Medicaid Services [CMS] 2018a). The current study uses patient experience/satisfaction measures to evaluate the quality of medical care. There are three types of health plans rated by NCQA, and three separate Consumer Assessment of Health Providers and Systems (CAHPS) surveys for private plans, Medicare Advantage, and Medicaid managed care, respectively. Our current research uses the quality measures generated from the CAHPS survey that is designed specifically for Medicaid managed care plans.

²The total enrollment in the Children's Health Insurance Program (CHIP) (Title XXI) was 6.6 million (CMS 2018a).

federal requirements, and is jointly funded by the federal government and the states. States generally pay for services through fee-for-service or managed care arrangements, whereas the federal government repays the states a specified percentage of program expenditures (called the federal medical assistance percentage [FMAP]). States pay providers directly for services under fee-for-service arrangements. Under managed care arrangements, states contract with and pay managed care organizations (MCOs) to deliver care through networks. MCOs accept a set payment per member per month (capitation) for these services.³ In 2016, 81.1% of Medicaid enrollees were served through managed care delivery systems (The Henry J. Kaiser Family Foundation [KFF] 2016), a health care delivery system organized to manage cost, utilization, and quality. By contracting with various types of MCOs to deliver Medicaid health services to their beneficiaries, states hope to better manage utilization of health services, reduce Medicaid program costs, and improve the quality of care. Detailed information about the Medicaid program is available from the CMS (<https://www.medicaid.gov/medicaid/index.html>).

The ACA aims to provide Americans with better health security through comprehensive health insurance reforms that expand coverage, lower health care costs, and enhance the quality of care. The minimum medical loss ratio (MLR) provision of the ACA limits the portion of premium dollars health insurers may spend on items such as administration, marketing, and profits. The hope is that this will translate into providing quality care at a better value to consumers. The MLR regulation took effect for private plans in 2011 (at least 80% MLR for individual and small-group health insurance markets and 85% for the large group market) and for Medicare in 2014 (85%).

On May 6, 2016, the CMS issued final regulations that revise and significantly strengthen existing Medicaid managed care rules (CMS 2016a). The final rule for the first time establishes a minimum MLR standard for Medicaid managed care. The final rule offers states the flexibility to set the minimum MLR at 85% or above. It requires MLR reporting and gives states the ability to determine whether a minimum MLR will be set with the option to require a remittance to the state if the specific MLR is not met.

The new Medicaid MLR standard was adopted for Medicaid managed care contracts starting on or after July 1, 2017. With this new final rule, the federal government seeks to “enable states to better manage and measure the quality of care” provided by Medicaid managed care plans. States are required to implement a quality rating system (QRS) for each managed care plan consistent with the Medicare Part C star ratings.⁴ States have 3 years after publication of the QRS to begin rating their Medicaid managed care plans (CMS 2016a).

Bentley et al. (2008) indicate that many of the health expenditures in the United States are unnecessary and wasteful. Therefore, improving economic efficiency is desirable and should be a central goal of any reform effort. However, increasing efficiency by reducing medical expenses alone could result in lower quality of care and patient dissatisfaction (Yang 2014). Quality of care should also be considered. In response to both the new MLR standard and the CMS final rule on Medicaid quality of care, this research is designed to examine the impact of efficiency and MLR on the quality of care for Medicaid managed care plans. Specifically, this current research links Medicaid’s health plan survey data with financial statement data, and uses various quality measures as dependent variables, to estimate the effect of efficiency and MLR. This research objective is accomplished by conducting a series of regression analyses. To the best of our knowledge, this current research is the first of its kind to examine the impact of efficiency and MLR on Medicaid’s quality of care. This research can provide some important insights on Medicaid regulation, performance, and quality improvement.

This article proceeds as follows. Some recent related studies are reviewed in the next section. Section 3 introduces the Medicaid quality measures related to patient experiences and satisfaction. Section 4 discusses the methodology, quality and financial data, variables, and hypotheses. Section 5 presents some descriptive statistics and univariate analyses of quality measures, MLR, and medical services efficiency. Section 6 presents the regression results of the effect of medical services efficiency and MLR on Medicaid’s quality of care, and Section 7 concludes.

2. LITERATURE REVIEW

Related to the topics examined in this research, this section presents a review of some recent studies on MLR, efficiency and cost savings, and quality of care. Milliman (www.milliman.com) has been conducting an annual analysis of the financial results of Medicaid managed care since 2009. These annual Milliman reports on Medicaid managed care provide reference

³MCOs do not establish their own capitation rates (premiums). A third party with no stake in the plans’ profits establishes these rates, and these premiums can vary by the demographic characteristic of the insured. MLRs are a comparison of medical expenses to premiums, so they are dependent upon how the premium is established. However, this current research examines the impact of the MLR on the quality of care of Medicaid, not the determinants of the MLR itself. In this research, the MLR is taken as given no matter how the premium is determined. The state dummy variables are included in this research to control for the state fixed effects, including the varying rating-setting practices.

⁴CMS (2018b) provides the detailed information on the Medicare Part C and D star ratings.

and benchmarking information for certain key financial metrics used in the day-to-day analysis of Medicaid MCO financial performance (Palmer 2009; 2010; 2011; Palmer and Pettit 2012; 2013; 2014; 2015; 2016; 2017; Palmer, Pettit, and McCulla 2018; 2019). Included among these key financial metrics are MLR, underwriting ratio, administrative ratio, and other financial measures.

With regard to the MLR regulation, Karaca-Mandic, Abraham, and Simon (2015) evaluate whether the MLR is a good target measure for regulation of the individual market by comparing the two components of the price–cost margin between markets that are more competitive versus those that are not. They find that insurers with monopolistic power have lower MLRs, but find no evidence that insurers' administrative expenses are lower in more concentrated insurance markets. Their results indicate that the MLR could serve as a target measure of market power in regulating the individual market for health insurance but with notable limited ability to capture product and firm heterogeneity.⁵ McCue, Hall, and Liu (2013) gauge the impact of medical loss ratio regulation on the financial performance of health insurers. They find that in the individual market, for-profit insurers reduced their median administrative cost ratio and operating margin by more than 2 percentage points each, resulting in a 7-percentage-point increase in their median medical loss ratio; financial ratios changed much less for insurers in the small- and large-group markets. Harrington (2013) analyzes the MLR regulations' potential unintended consequences and incentive effects, such as higher medical costs and premiums for some insurers, and discusses modifications and alternatives to the MLR regulations to help achieve their stated goals with less potential for adverse effects.

Some studies have examined Medicaid efficiency and cost savings. Health insurance efficiency can be evaluated from different perspectives. Yang and Lin (2017) examine three efficiency measures of health insurers: (1) the operating efficiency from the perspective of the insurer to generate profits (maximizing profits given costs), (2) the medical services data envelopment analysis (DEA) efficiency from the perspective of the society providing cost effective health care services to its citizens (minimizing medical costs given medical services), and (3) a composite DEA efficiency, which accommodates the two perspectives as just described.⁶ With respect to the efficiency of Medicaid, Yang (2014) compares five business lines of health insurance from the societal DEA perspective and finds that Medicaid is the second most efficient, after Medicare supplement insurance. This provides support for offering coverage and the expansion of Medicaid to enhance health from the societal efficiency perspective (more medical services with fewer resources inputs). On the other hand, from the DEA perspective of generating insurer profits, Brockett, Golden, and Yang (2018) show that Medicaid is the least efficient.⁷

States have turned to Medicaid managed care plans to cut costs and gain more budget predictability. Duggan and Hayford (2013) find that the effects of shifting Medicaid recipients from fee-for-service into Medicaid managed care vary significantly across states as a function of the generosity of the state's baseline Medicaid provider reimbursement rates. They also say their results obtained in the Medicaid environment are “consistent with recent research on managed care among the privately insured, which finds that HMOs and other forms of managed care achieve their savings largely through reduced prices rather than lower quantities.” In an earlier study, Duggan (2004) estimates the effect of Medicaid managed care by exploiting county-level mandates introduced in the state of California, which required most Medicaid recipients to enroll in a managed care plan. While the generalizability of California Medicaid results to other jurisdictions' Medicaid results should be taken cautiously (because the California Medicaid program is very different from other states' Medicaid programs), Duggan's (2004) results demonstrate that in California the switch from fee-for-service to managed care was associated with a substantial increase in government spending but no corresponding improvement in infant health outcomes. These findings cast doubt on the hypothesis that Medicaid managed care could reduce the strain on government budgets.

Health care delivery and patient experience with health care remain significant challenges. Patient-centered care has gained renewed focus as an essential model for ensuring the quality of patient care. With regard to Medicaid's quality of care,

⁵Karaca-Mandic, Abraham, and Simon (2015) examine the determinants of MLR of the individual market and indicate that “certain firm characteristics (non-profit status, firm size, and business tenure) may be inherently related to the price-cost margins even in the absence of market power.” This current research investigates the impact of MLR (and medical services efficiency) on the quality of care of Medicaid, not the determinants of MLR. Additionally, we investigate a more homogeneous population as we restrict our attention to a subgroup excluding CHIP, health insurers with “specialized behavioral health plans or long-term services and supports plans,” insurers for which “premium revenues indicate a limited set of covered services,” or “reported values appears to be influenced by unusual circumstances,” and those Medicaid plans for which the National Association of Insurance Commissioners (NAIC) annual statements are unavailable.

⁶The efficiency score is the optimal ratio of weighted outputs over weighted inputs. It is obtained using data envelopment analysis (DEA). Detailed information of DEA models is available in Cooper, Seiford, and Tone (2007).

⁷This result from a profit DEA perspective is not surprising since MCOs do not establish their own capitation rates and cannot increase their capitation rates to keep profit levels at a targeted percentage. They are required to accept the rate offered them if they want to continue to provide services. This illustrates why the perspective taken in the DEA analysis (e.g., societal or insurer) matters. From the insurers' (profit) perspective using profit as the DEA output variable, Medicaid fares relatively poorly. From a societal perspective with enrollment (persons covered) and the utilization of medical services (ambulatory encounters and hospital patient days) as the DEA outputs, Medicaid fares very well.

Paradise and Garfield (2013) and Rudowitz, Garfield, and Hinton (2019) indicate that Medicaid is a cost-effective program, Medicaid beneficiaries have robust access to care overall, and rates of access to care and satisfaction with care among Medicaid enrollees are comparable to rates for people with private insurance. Cunningham and Nichols (2005) show that high Medicaid acceptance rates by physicians in a community are more important than fee levels in affecting enrollees' access to medical care. Although high fee levels increase the probability that individual physicians will accept Medicaid patients, high fee levels do not necessarily lead to high levels of physician Medicaid acceptance in an area. Their results suggest that a broad range of factors need to be considered to increase access to physicians for Medicaid enrollees. Decker (2007) analyzes the relationship between Medicaid physician fees and the quality of medical care of Medicaid patients. These results imply that higher Medicaid fees increase the number of private physicians who see Medicaid patients, and higher fees lead to visit times with physicians that are more comparable to visit times with private pay patients. Polsky et al. (2015) examine the effect on access to primary care of increased Medicaid reimbursements for primary care services in 2013 and 2014 and find that increased Medicaid reimbursement to primary care providers was associated with improved appointment availability for Medicaid enrollees without generating longer waiting times. This addresses a key provision of Affordable Care Act.

Some researchers have explored the coverage expansion of ACA provisions. For example, Frean, Gruber, and Sommers (2017) assess the coverage effect of Medicaid expansion, premium subsidies, and the individual mandate of the ACA. They find that coverage was moderately responsive to price subsidies, with larger gains in state-based insurance exchanges than the federal exchange. The individual mandate's exemptions and penalties had little impact on coverage rates. Even in nonexpansion states the ACA law increased Medicaid among individuals gaining eligibility under the ACA, and among previously eligible populations (the so-called "welcome mat" effect), with no resulting reductions in private insurance. However, much of the focus of the ACA remains on issues such as health care cost controls and quality of care.

3. MEDICAID MANAGED CARE QUALITY MEASURES

Customer satisfaction/experience and clinical measures are commonly adopted to rate health plan quality. In evaluating the quality of Medicaid managed care plans, this research uses the quality measures of customer experience and satisfaction generated by the health plan surveys of the Consumer Assessment of Healthcare Providers and Systems (CAHPS). CAHPS surveys ask consumers and patients to report on and evaluate their health care experiences. Surveys cover topics important to consumers and focus on those aspects of quality that consumers are best qualified to assess. The CAHPS program is funded and overseen by the Agency for Healthcare Research and Quality (AHRQ), a government organization. AHRQ and its grantees and contractors develop and maintain the CAHPS surveys; they do not administer any of the surveys to patients or require use of the surveys. Qualified vendors administer the surveys. Detailed information of the CAHPS program is available at <https://www.ahrq.gov/cahps/index.html>.

The three most widely used CAHPS surveys are:

- The CAHPS Health Plan Survey, which asks enrollees in commercial plans, Medicaid, Children's Health Insurance Programs (CHIP), and Medicare about their experiences with health plan services and ambulatory care.
- The CAHPS Clinician and Group Survey (CG-CAHPS), which asks patients to report on their experiences with primary or specialty care received from providers and their staff in ambulatory settings.
- The CAHPS Hospital Survey (HCAHPS), which asks patients about the care delivered during an inpatient stay at a hospital facility.

The CAHPS Health Plan Survey is a tool for collecting standardized information on enrollees' experiences with health plans and their services. It was designed to support consumers in assessing the performance of health plans and choosing the plans that best meet their needs. Health plans can also use the survey results to identify their strengths, weaknesses, and areas to target for improvement. Since its launch in 1997, this survey has become the national standard for measuring and reporting on the experiences of consumers with their health plans. The CAHPS Health Plan Survey generates two types of results for reporting purposes (AHRQ 2015):

- Rating measures are based on items that use a scale of 0 to 10 to measure respondents' assessment of their health plan and the quality of care received over a specified period of time. This measure is sometimes referred to as the "global rating" or "overall rating."
- Composite measures (also known as reporting composites) combine results for closely related items that have been grouped together. The calculation of CAHPS survey composites uses a proportional scoring method, which basically

generates a proportion for each response option. First, calculate the proportion of patient responses in each response category for each item in a composite. Then combine these proportions for all items in a composite, that is, calculate the average proportion responding to each category across the questions in the composite.

Specifically, the Health Plan Survey produces the following eight measures:

- Getting needed care (composite of two items).
- Getting care quickly (composite of two items).
- How well doctors communicate (composite of four items in the Adult Survey; composite of five items in the Child Survey).
- Health plan customer service (composite of two items).
- Enrollees' rating of their health plan (one item).
- Enrollees' rating of their health care (one item).
- Enrollees' rating of their personal doctor (one item).
- Enrollees' rating of their specialist (one item).

Descriptions of these measures and lists of the survey questions included in each measure are provided in [Table 1](#) for the Adult Survey of the CAHPS Health Plan 5.0 (AHRQ 2015).

Dedicated to improving health care quality, the National Committee for Quality Assurance (NCQA) and the CMS both administer some CAHPS Health Plan Surveys. CAHPS surveys are an integral part of CMS's efforts to improve health care in the United States. Many of the CMS patient experience surveys are in the CAHPS family of surveys. Others are developed following CAHPS principles. CMS has conducted the CAHPS Health Plan Survey with Medicare beneficiaries since 1998. The Medicare Survey includes versions for Medicare Advantage plans (including preferred provider organizations [PPOs]), prescription drug plans, and the fee-for-service program.

NCQA has played a central role in driving quality improvement throughout the health care system since its founding in 1990. Three types of health plans are rated by NCQA: private plans that people enroll in through work or on their own; plans that serve Medicare beneficiaries in the Medicare Advantage program; and plans serving Medicaid beneficiaries. NCQA ratings are based on three types of quality measures: measures of clinical quality from NCQA's Healthcare Effectiveness Data and Information Set (HEDIS); measures of consumer satisfaction using a modified version of the CAHPS Health Plan Survey; and results from NCQA's review of a health plan's health quality processes (i.e., performance on NCQA accreditation standards) (NCQA 2018). The CMS also requires reporting of child and adult core sets, which are HEDIS-like measures developed for Medicaid populations. Some states develop their own clinical measures for evaluating quality outcomes in Medicaid populations.

4. DATA AND RESEARCH DESIGN

The research in this article links customer experience/satisfaction quality data with the insurer's financial statement data for the same time period, and utilizes a series of regression analyses to estimate the effect of MLR and efficiency on the quality of care for the Medicaid managed care plans. The quality measure data are obtained from NCQA,⁸ and the insurer's financial statement data are obtained from the National Association of Insurance Commissioners (NAIC). The time period under consideration is 2007–2012 since only these six years of quality data are publicly available from NCQA at this time.⁹

⁸The source for data contained in this publication is Quality Compass® [2007–2012] and is used with the permission of the National Committee for Quality Assurance (NCQA). Any data display, analysis, interpretation, or conclusion based on these data is solely that of the authors, and NCQA specifically disclaims responsibility for any such display, analysis, interpretation, or conclusion. Quality Compass is a registered trademark of NCQA. HEDIS® is a registered trademark of NCQA. CAHPS® is a registered trademark of the Agency for Healthcare Research and Quality (AHRQ).

⁹There is always a significant lag between the time the data is collected and the time the research is conducted/published. In discussing efficiency studies in insurance, Cummins and Weiss (2013, 857) indicate that the average time from the end of the data period to release of the research is 6.6 years. For example, Karaca-Mandic, Abraham, and Simon (2015) use data from 2001–2009. Our research aims to provide evidence on whether the MLR regulation is necessary by examining the impact of MLR on the quality of care. For this research, the MLR data should be unregulated and unmanipulated. Therefore, more recent data may actually be less appropriate because the MLR regulation in other sectors (such as MLR regulation for Medicare in 2014) might impose some potential influence on the MLR of Medicaid managed care (the spillover effect).

TABLE 1
Quality Measures and Survey Questions for the CAHPS Health Plan 5.0 Adult Survey

Getting needed care		
The survey asked enrollees how often it was easy for them to get appointments with specialists and get the care, tests, or treatment they needed through their health plan.		
Q9	Easy for respondent to get necessary care, tests, or treatment	Response options
Q18	Respondent got appointment with specialists as soon as needed	<ul style="list-style-type: none"> • Never • Sometimes • Usually • Always
Getting care quickly		
The survey asked enrollees how often they got care as soon as needed when sick or injured and got non-urgent appointments as soon as needed.		
Q4	Respondent got care for illness/injury as soon as needed	Response options
Q6	Respondent got non-urgent appointment as soon as needed	<ul style="list-style-type: none"> • Never • Sometimes • Usually • Always
How well doctors communicate		
The survey asked enrollees how often their personal doctor explained things clearly, listened carefully, showed respect, and spent enough time with them.		
Q12	Doctor explained things in a way that was easy to understand	Response options
Q13	Doctor listened carefully to enrollee	<ul style="list-style-type: none"> • Never • Sometimes • Usually • Always
Q14	Doctor showed respect for what enrollee had to say	
Q15	Doctor spent enough time with enrollee	
Health plan customer service		
The survey asked enrollees how often customer service staff were helpful and treated them with courtesy and respect.		
Q22	Customer service gave necessary information/help	Response options
Q23	Customer service was courteous and respectful	<ul style="list-style-type: none"> • Never • Sometimes • Usually • Always
Enrollees' ratings		
The survey asked enrollees for several ratings on a scale of 0 to 10, with 0 being the worst and 10 being the best.		
Q8	Rating of all health care	Response options
Q16	Rating of personal doctor	<ul style="list-style-type: none"> • 0–10
Q20	Rating of specialist	
Q26	Rating of health plan	

For each of the quality variables, we estimate the following regression model:

$$Y_{ist} = \beta_0 + \beta_1 \text{Efficiency}_{ist} + \beta_2 \text{MLR}_{ist} + \gamma X_{ist} + \eta \text{Year}_t + \delta \text{State}_s + \varepsilon$$

where Y_{ist} represents the quality measure for insurer i domiciled in state s in year t . The coefficients of interest would be β_1 and β_2 , which measure the impact of efficiency and MLR. $Year$ is a vector of year fixed effects, and $State$ is a vector of state fixed effects. A vector of control variables of insurer characteristics, X_{ist} , consists of the insurer organization type, group affiliation, number of states the insurer serves, insurer size, payment methods, and number of different business lines and product types.¹⁰

For this research, the quality composite measure is the proportion of “Usually and Always” responses (Usually + Always), while the overall rating is the proportion of “8, 9, and 10” responses (8 + 9 + 10) (AHRQ 2015). Consistent with the NCQA’s raw data, the rating and measure scores are converted to a 0–100 scale (the proportion is multiplied by 100). However, in its annual summary reports of health plans, NCQA uses a 0–5 scale for the overall rating and the composite and subcomposite measures (0–100 scale for the overall ranking before 2015) (<http://www.ncqa.org/report-cards/health-plans>). This research adopts a 0–100 scale for all the quality measures for the regression purpose.

The following seven quality measures are used as dependent variables (“Health plan customer service” was not used since it did not have enough data):

- Getting needed care (Usually + Always).
- Getting care quickly (Usually + Always).
- How well doctors communicate (Usually + Always).
- Rating of health plan (8 + 9 + 10).
- Rating of all health care (8 + 9 + 10).
- Rating of personal doctor (8 + 9 + 10).
- Rating of specialist (8 + 9 + 10).

Additionally, the dependent variables also include three aggregate ratings of the measures (still on the 0–100 scale). The first aggregate rating is the average of all the seven measures. It corresponds to the NCQA’s “overall rating” of health plans, which, however, NCQA provides on a 0–5 scale, rounded to the nearest half point. The second aggregate rating is the average of six measures without “Rating of specialist.” The reason to exclude “Rating of specialist” is that a specialist might not be seen often, and the rating of specialists might not appropriately reflect the overall quality of the health plan itself. The third aggregate rating is the average of four measures without the rating of doctors and specialists; that is, the three measures of “How well doctors communicate,” “Rating of personal doctor,” and “Rating of specialist” are excluded. The rationale for these exclusions is that the rating of doctors and specialists might be confounded by non-plan-related factors such as the doctor/specialist’s personality and social skills. The measures included in the third aggregate rating are consistent with the CMS’s current rating measures of “member experience with health plan” for Medicare Advantage (except that the CMS measurers also include “care coordination” and “customer service”).

Regarding the control variables of insurer characteristics, the organizational type variable is a dummy variable: 1 for stock insurers, and 0 for others. Group affiliation is also a dummy variable: 1 if the insurer is affiliated with a group, and 0 for unaffiliated insurers. A dummy variable is included for the number of states the insurer serves: 1 if the insurer operates in multiple states. The size of the insurer is measured by the logarithm of the insurer’s enrollment as measured by total member months. From the NAIC data, payment methods include capitation payments, contractual fee payments, fee-for-service payments, bonus/withhold—fee-for-service, bonus/withhold—contractual fee payments, noncontingent salaries, aggregate cost arrangements, and other payments. For any payment method, the measure is its percentage of total payments received. NAIC classifies health insurance into comprehensive (hospital and medical)—individual, comprehensive (hospital and medical)—group, Medicare supplement, federal employees health benefit plan, Medicare, and Medicaid. Product types include health maintenance organizations (HMOs), provider service organizations (PSOs), preferred provider organizations (PPOs), point of

¹⁰As a practical matter, the timeline of data gathering is such that the quality ratings are ex post survey measures collected after medical services were received and medical expenses were incurred. Therefore, we formulate the regression model with medical expenses and medical services coming before as right-hand-side variables, with quality ratings as the left-hand-side variables. In the analysis, we are not viewing this as a causal relationship, but rather as a useful predictive relationship (similar to Actuarial Standard #12 section 3.2.2 on causality). Put otherwise, we use the regression to explain and predict an existing relationship that elucidates the development of the left-hand-side variables as related to the right-hand-side variables. We are not claiming causality, but rather explanatory or predictive power (similar to the use of credit scoring explaining or predicting auto insurance losses).

service (POS), indemnity only, and others. These are all measured by their percentage of the total enrollment. Most insurers do not use all the payment methods or operate in all lines, and they do not offer all the different types of plans. There is also some multicollinearity among these variables. Therefore, only some of them are included in the regression models.

This research uses data envelopment analysis (DEA) to generate an efficiency measure for how well Medicaid managed care plans utilize their input resources to provide output performances. DEA is a mathematical programming frontier approach to estimating the relative efficiency of a homogeneous set of peer entities (called decision-making units or DMUs). The relative efficiency of a DMU is measured by comparing each DMU to a “best practice” efficient frontier formed by connecting the output produced by the most efficient DMUs as a function of their inputs. The methodology allows for multiple inputs and multiple outputs, and the efficiency score for a particular DMU is obtained as the optimal ratio of a weighted sum of outputs over the weighted sum of inputs. The optimization (weight selection given as coefficients to the multiple inputs and multiple outputs) selects the weight vector so as to make the DMU under examination as efficient looking as possible, subject to natural constraints (such as no other DMU can use these same weights to be more than 100% efficient, as this would violate the conservation of resources principle). The interested reader is referred to Cooper, Seiford, and Tone (2007) for details and references, and a computer code to implement the analysis. The efficient frontiers serve as benchmarks for the inefficient DMUs to follow and improve performance. This DEA technique has been widely used in insurance research to investigate relative efficiency of decision-making units in insurance-related organizations.¹¹

Different parties conducting an efficiency analysis can have different perspectives of what constitutes the best performance (e.g., what seems better for stockholders may be different from what is better for individual clients, or from the perspective of society at large), and this is related to the choice of inputs and outputs in the DEA analysis. The Medicaid efficiency measure used in this research is “medical services efficiency” from the societal perspective (Brockett et al. 2004; Yang 2014; Yang and Wen 2017; Brockett, Golden, and Yang 2018). The medical services efficiency evaluates the insurer’s performance in providing policyholders’ medical services (which are received from health providers) with reasonable costs. Accordingly, the outputs are the measures of health coverage and medical services; and the inputs are the costs incurred by the insurer and health providers. Specifically, the outputs include enrollment (persons covered) and the utilization of medical services (ambulatory encounters and hospital patient days), and the inputs are hospital and medical expenses (paid to health providers), claim adjustment, and general administrative expenses (paid to administrative and claim adjustment staff) (Yang and Wen 2017). In the interests of space, other perspectives for evaluating the efficiency of Medicaid programs such as profit maximization from the insurer’s perspective are not considered here.¹² The societal perspective is adopted in this current research because Medicaid is a societally oriented set of governmental programs designed to focus on “providing health care services with reasonable medical costs” to society members.

Some data considerations were necessary to address in order to execute the research presented in this article. To perform this analysis we needed to restrict the universe of organizations considered to those for which the requisite data are available. Many MCOs that deliver care to Medicaid populations are not considered to be insurers and are not required to make financial filings with NAIC. Our current research needs financial information from these annual statements to perform the analysis. Accordingly, as a first data cut, we restricted attention to organizations for which the NAIC annual statements are available. For these health insurers we analyze the Title XIX Medicaid line of business on their NAIC financial statements. Additionally, the two medical services utilization measures (ambulatory encounters and hospital patient days) needed for efficiency determination are not available for the Title XXI Children’s Health Insurance Program (CHIP) separately. Therefore, CHIP is also not included in this research. Finally, as in Palmer, Pettit, and McCulla (2018), health insurers with “specialized behavioral health plans or long-term services and supports plans” are excluded from this research, as well as insurers for which “premium revenues indicate a limited set of covered services” or “reported values appear to be influenced by unusual circumstances.”

An input-oriented DEA model is adopted in this research to obtain DEA efficiency scores; that is, the efficiency score is generated by minimizing the amount of inputs (costs) used to produce a given output level. This is in contrast to an output-oriented DEA model that would focus on maximizing output for a fixed level of inputs. Since the Medicaid program is designed to provide service to society at minimum costs, the input orientation seems most appropriate. The DEA optimization

¹¹The primary alternative mathematical approach to efficiency in health care programs and providers is stochastic frontier regression (SFR). A World Health Organization book (Hollingsworth 2016) addressing efficiency in the health care system found more than 400 published health care-related articles using either DEA or SFR over the 30 years ending in 2016. Hollingsworth (2016, 99) reports that “DEA has been used a great deal more than SFA, making up the majority of applications in health care settings (>90%) and can account for multiple inputs and outputs, varying weights and returns to scale.” A review of the literature of efficiency in insurance by Cummins and Weiss (2013, 814) also concluded that DEA is preferred to SFA for studies where the objective is to study the performance of individual insurance companies, or where there are moderate sample sizes.

¹²Other perspectives would include an individual consumer’s perspective and a health care investor’s perspective. The differences between these perspectives relate to what constitutes important “output” and “inputs,” and are discussed in Brockett et al. (2004) and Brockett, Golden, and Yang (2018). For example, profit is an important output for investors, whereas expanded health care provision is more important from a societal perspective.

problems are solved by using the DEA software developed by Joe Zhu (Zhu 2009). The higher the efficiency score, the lower the cost (including medical payments) for a fixed level of utilization and enrollment. Conversely, for a given cost, higher efficiency means higher enrollment and utilization. Lower medical payments to the provider who is servicing the same patient base can make providers feel underpaid, and these providers consequentially might restrict access to quality care and lower certain quality of care metrics. Accordingly, it is hypothesized that customer perception of quality of service (quality metrics) would be lower for those insurers with higher efficiency scores. Accordingly, the first hypothesis of this research is:

Hypothesis 1. The relationship between Medicaid efficiency and perceived quality of care is significantly negative.

The MLR is computed as the ratio of total hospital and medical expenses (incurred claims plus the change in contract reserves) to earned premiums. MLR can be affected by rate setting methodologies and premium taxes. Our choice of MLR is a simple loss ratio without adjustment for taxes and fees, or quality improvement expenses. This is consistent with the literature examining MLR (Karaca-Mandic, Abraham, and Simon 2015; Fehr, Co,x and Levitt 2018; Yang 2018).¹³ For more information on the different definitions of MLR, see Palmer, Pettit, and McCulla (2019).

The minimum MLR requirement limits the portion of premium dollars health insurers may spend on administration and profits and aims to provide quality care of better value to consumers. The higher the MLR, the higher are the medical payments (given the earned premium). This might lead to more medical services of better quality. This is exactly opposite to the mechanism of the medical services efficiency. Therefore, it is expected customer satisfaction would be higher with higher MLR.

The second hypothesis of this research is:

Hypothesis 2. MLR has a significant positive effect on the quality of care.

5. DESCRIPTIVE AND UNIVARIATE ANALYSES

This section presents some summary statistics and correlation analyses of the quality ratings, medical services efficiency, and medical loss ratio of Medicaid managed care plans. The number of insurers and the summary statistics for the seven quality measures of Medicaid managed care plans are presented in Table 2 (for the period 2007–2012), for all the insurers that have NCQA quality data (but that may not all have corresponding NAIC data on financial variables), and for the insurers that have both the quality data and NAIC financial data. The regression models are conducted for the insurers which have both NCQA quality data and NAIC financial data.

Of the three composite quality measures for all the insurers with quality data, “How well doctors communicate” is rated the highest: On average, 87% of respondents rate “Usually” or “Always.” “Getting care quickly” is around 4 percentage points higher than “Getting needed care.” Of the four overall rating measures for all the insurers with quality data, “Rating of all health care” is the lowest: 68.22% of respondents rated it 8, 9, or 10 (out of 10). “Rating of health plan” is in the middle, with 72.5% of respondents who rated it 8, 9, or 10.

Generally, the average ratings are similar for the insurers with NCQA quality data only and the sample of the insurers for the regression analysis (the insurers with both NCQA quality data and NAIC financial data). For example, the average ratings of these two data sets (NCQA and NCQA + NAIC) are 68.22% and 68.77% for “Rating of all health care (8 + 9 + 10),” and 72.50% and 72.87% for “Rating of health plan (8 + 9 + 10),” respectively.

In summary, the average rating scores of Medicaid managed care are 80.34%, 76.24%, and 68.22% for “Getting care quickly (usually + always),” “Getting needed care (usually + always),” and “Rating of all health care (8 + 9 + 10),” respectively. The average of these three measures is 74.93%, which shows Medicaid managed care is providing a reasonably high level of health care at acceptable levels of quality. However, if possible, it would be ideal to improve its quality of care to a higher level. This research examines the factors impacting the quality of care of Medicaid managed care, hopefully providing some important insights on its quality improvement potentials.

The number of insurers with NAIC financial data and the summary statistics of the Medicaid medical services efficiency and medical loss ratio are presented in Table 3. Because each of the quality measures serves as a dependent variable of our regression models, the efficiency is presented for all the groups of insurers with both NAIC data and data of each of the quality

¹³Many states implement premium taxes on MCOs that are pass-through payments back to the states in which they operate. The MLRs in states with premium taxes may appear lower than those in states without a premium tax. Also, these premium tax amounts can vary by state. Additionally, the amount of tax will impact the MLRs between states that have premium taxes. However, as in Karaca-Mandic, Abraham, and Simon (2015), Fehr, Cox, and Levitt (2018), and Yang (2018), the medical loss ratio in the current research is a simple loss ratio without adjustment for taxes and fees, or quality improvement expenses. It should be noted that in the final rule on Medicaid managed care, CMS allows the inclusion of quality improvement costs that benefit the consumer as part of the cost of medical expenses in the numerator of the MLR ratio. Thus, there can be a difference between MLR definition used in this and other cited papers and the CMS definition.

TABLE 2
Summary Statistics of the Rating Scores (0–100) of the Seven Quality Measures for Medicaid Managed Care: 2007–2012

Quality measure	Insurers with NCQA quality data			Insurers with both NCQA quality data and NAIC data		
	Number of insurers	Mean	Std dev	Number of insurers	Mean	Std dev
Getting care quickly (Usually + Always)	555	80.34	4.95	332	81.34	3.52
Getting needed care (Usually + Always)	546	76.24	6.60	327	77.38	5.51
How well doctors communicate (Usually + Always)	556	87.34	3.24	332	87.91	2.74
Rating of all health care (8 + 9 + 10)	558	68.22	5.23	334	68.77	5.06
Rating of health plan (8 + 9 + 10)	558	72.50	6.23	334	72.87	6.47
Rating of personal doctor (8 + 9 + 10)	557	76.45	4.33	333	76.75	3.99
Rating of specialist (8 + 9 + 10)	498	76.49	4.35	304	76.61	4.23

TABLE 3
Summary Statistics of the Medicaid Medical Services Efficiency and Medical Loss Ratio: 2007–2012

Insurers	Number of insurers	Medical services efficiency		Medical loss ratio	
		Mean	Std dev	Mean	Std dev
All insurers with NAIC data	887	0.31	0.20	89.2%	17.5%
Insurers with NAIC data and data of "Getting care quickly"	332	0.27	0.16	87.2%	8.1%
Insurers with NAIC data and data of "Getting needed care"	327	0.27	0.16	87.4%	8.1%
Insurers with NAIC data and data of "How well doctors communicate"	332	0.27	0.16	87.2%	8.1%
Insurers with NAIC data and data of "Rating of all health care"	334	0.27	0.16	87.2%	8.2%
Insurers with NAIC data and data of "Rating of health plan"	334	0.27	0.16	87.2%	8.2%
Insurers with NAIC data and data of "Rating of personal doctor"	333	0.27	0.16	87.2%	8.2%
Insurers with NAIC data and data of "Rating of specialist"	304	0.27	0.16	87.4%	8.0%

measurers, respectively. This shows that each of the subgroups should be representative of the whole population with regard to efficiency. The average efficiency of each subgroup is similar to that of all the insurers (0.27 vs. 0.31). Compared to all the insurers with NAIC financial data, the average MLR of each subgroup is similar to that of all the insurers. However, the standard deviation of the subgroups is around 8% (last column in Table 3), much smaller than that of all insurers with NAIC data (17.5%) (Table 3).

The correlation analysis is conducted for the quality measures, the medical services efficiency, and the MLR. The results are presented in Table 4. There is a negative (but very low) correlation between the quality measures and the medical services efficiency. This indicates a negative (but insignificant) effect of the medical services efficiency on the quality of care. On the contrary, there is a positive correlation between the quality measures and the MLR, and thus a positive effect of the MLR on the quality of care. Specifically, the correlation between "Rating of all health care" and MLR (medical services efficiency) is 0.312 (–0.132).

TABLE 4
Correlation Between Quality Measures, Medical Services Efficiency, and Medical Loss Ratio (MLR)

Quality measures	Number of insurers	Total member months	Medical services efficiency	Medical loss ratio
Getting care quickly (Usually + Always)	332	461,987,393	-0.063	0.071
Getting needed care (Usually + Always)	327	455,320,691	-0.053	0.145
How well doctors communicate (Usually + Always)	332	461,987,393	-0.099	0.249
Rating of all health care (8 + 9 + 10)	334	465,752,136	-0.132	0.312
Rating of health plan (8 + 9 + 10)	334	465,752,136	-0.085	0.275
Rating of personal doctor (8 + 9 + 10)	333	463,819,951	-0.123	0.245
Rating of specialist (8 + 9 + 10)	304	426,043,655	-0.002	0.056

TABLE 5
Regression Estimates of the Impact of Medical Services Efficiency and Medical Loss Ratio (MLR) on Quality of Care: Composite Quality Measures as Dependent Variables

Independent variables	Getting care quickly Coefficient	Getting needed care Coefficient	How well doctors communicate Coefficient
Medical services efficiency	0.317	-1.257	-0.969
Medical loss ratio (MLR)	1.759	7.101**	0.958
Stock insurer	-0.218	-2.879***	-0.205
Group affiliation	-0.341	-0.441	-0.161
Single state insurer	0.220	0.575	0.044
Log of member months	1.516**	3.403***	0.712
Capitation payments (%)	-2.115	-1.204	-1.020
Contractual fee payments (%)	-0.747	-0.269	-0.983
Bonus/withhold—contractual fee payments (%)	3.567	-0.269	4.188*
HMO (%)	-1.051	-0.476	-0.324
POS (%)	1.437	-3.755	1.686
Comprehensive—individual (%)	-2.143	0.534	2.644
Medicare (%)	0.427	0.461	0.698
R ²	0.443	0.617	0.489
Adjusted R ²	0.348	0.553	0.402
Observations	332	327	332

Note: Other variables included in regressions are year fixed effects and state fixed effects.

*** $p < 0.01$,

** $p < 0.05$,

* $p < 0.1$.

6. IMPACT OF MEDICAL SERVICES EFFICIENCY AND MLR ON QUALITY OF CARE: MULTIVARIATE RESULTS

This section presents the regression estimates of the impact of MLR and medical services efficiency on the quality of care of Medicaid managed care plans. As stated, there are 10 regressions with the seven quality measures and the three aggregate ratings as the dependent variables, respectively. The regression results are presented in Table 5 (composite measures), Table 6 (overall ratings), and Table 7 (aggregate ratings).

For the three composite measures and the four overall ratings, the effect of the medical services efficiency is mixed. It has an insignificant negative effect on “Rating of all health care,” “Getting needed care,” and “How well doctors communicate,” a significant negative effect on “Rating of health plan” and “Rating of personal doctor,” but an insignificant positive effect on

TABLE 6
Regression Estimates of the Impact of Medical Services Efficiency and Medical Loss Ratio (MLR) on Quality of Care:
Overall Quality Ratings as Dependent Variables

Independent variables	Rating of all health care Coefficient	Rating of health plan Coefficient	Rating of personal doctor Coefficient	Rating of specialist Coefficient
Medical services efficiency	-1.944	-3.089*	-2.575*	2.514
Medical loss ratio (MLR)	5.922*	3.755	0.885	-1.908
Stock insurer	-1.683**	-4.364***	0.618	-1.400**
Group affiliation	-0.077	-0.894	-0.944	-0.137
Single state insurer	-0.814	-0.149	-0.077	0.281
Log of member months	2.255**	5.220***	0.862	-0.499
Capitation payments (%)	-2.285	-2.005	0.102	0.387
Contractual fee payments (%)	-1.536	-2.735*	0.398	4.231***
Bonus/withhold—contractual fee payments (%)	-1.302	-6.001	1.880	9.927**
HMO (%)	0.973	5.786***	1.555	0.398
POS (%)	4.812	0.479	3.896	0.050
Comprehensive—individual (%)	5.743	10.183**	6.782**	-0.730
Medicare (%)	1.339	-4.314	0.281	5.966
R^2	0.525	0.663	0.426	0.351
Adjusted R^2	0.445	0.606	0.330	0.231
Observations	334	334	333	304

Note: Other variables included in regressions are year fixed effects and state fixed effects.

*** $p < 0.01$,

** $p < 0.05$,

* $p < 0.1$.

“Getting care quickly” and “Rating of specialist.” However, to evaluate the quality of health care, it should be reasonable to focus on the responses on “Rating of all health care,” especially when there exist inconsistent results. Furthermore, the medical services efficiency has a negative effect on all the three aggregate ratings, although insignificant. Therefore, the result does not support the first alternative hypothesis that medical services efficiency has a (significant) negative effect on quality of care.

Due to the insignificant but negative effect, quality deterioration and patient dissatisfaction due to efficiency improvement should not be a big concern. In other words, the results indicate that there should be room to improve medical services efficiency without significantly reducing the quality of care. On average, the medical services efficiency of the sample is 0.27 (Table 3). If the average medical services efficiency is increased by 0.16 (one standard deviation), the aggregate rating of the six quality measures (without “Rating of specialist”), for example, would be reduced by only 0.254 percentage point (the coefficient of the medical services efficiency is -1.586 in the regression results), other things being equal. The magnitude of the effect is very small and the effect is thus negligible. With coefficient estimates of -0.365 and -1.537, respectively, the other two aggregate ratings would be reduced even less.

It is shown that there should be room to improve medical services efficiency without significantly reducing the quality of care. Medical service efficiency might be enhanced through some innovative health care payment and delivery models such as accountable care organizations (ACOs). According to the Center for Health Care Strategies, Inc. (www.chcs.org), state-based Medicaid accountable care organizations (ACOs) are becoming increasingly prevalent, with more states pursuing this model as a way to align provider and payer incentives to focus on value instead of volume. ACOs offer promising potential for improving patient outcomes and controlling costs by shifting accountability for risk and quality to providers. Brockett, Golden, and Yang (2018) indicate that efficiency improvement through Medicare ACOs has the potential to generate around 5% to 8% cost savings. Future research is needed to explore whether Medicaid ACOs are able to achieve savings through improving efficiency.

The CMS’s final rule of 2016 on managed care in Medicaid and the Children’s Health Insurance Program (CHIP) contains several provisions designed to strengthen states’ delivery and payment initiatives and improve efficiency and quality of care.

TABLE 7
Regression Estimates of the Impact of Medical Services Efficiency and Medical Loss Ratio (MLR) on Quality of Care:
Aggregate Quality Ratings as Dependent Variables

Independent variables	Aggregate rating 1 Value	Aggregate rating 2 Value	Aggregate rating 3 Value
Medical services efficiency	-0.365	-1.586	-1.537
Medical loss ratio (MLR)	3.582*	3.772*	5.290**
Stock insurer	-1.168***	-1.463***	-2.277***
Group affiliation	-0.447	-0.482	-0.444
Single state insurer	1.285	0.040	0.015
Log of member months	1.403**	2.377***	3.152***
Capitation payments (%)	-2.215*	-1.555	-2.026
Contractual fee payments (%)	-0.830	-1.017	-1.390
Bonus/withhold—contractual fee payments (%)	1.279	0.350	-1.060
HMO (%)	0.483	1.105	1.328
POS (%)	0.140	1.152	0.240
Comprehensive—individual (%)	2.992	3.998	3.614
Medicare (%)	5.774**	0.146	-0.316
R ²	0.575	0.578	0.612
Adjusted R ²	0.497	0.507	0.547
Observations	304	327	327

Note: Other variables included in regressions are year fixed effects and state fixed effects.

****p* < 0.01,

***p* < 0.05,

**p* < 0.1.

TABLE 8
Correlation Between Medical Loss Ratio (MLR) and Medical Service Efficiency (MSE)

Insurers	Number of insurers	Correlation of MLR and MSE
All insurers with NAIC data	887	-0.019
Insurers with NAIC data and data of "Getting care quickly"	332	-0.050
Insurers with NAIC data and data of "Getting needed care"	327	-0.044
Insurers with NAIC data and data of "How well doctors communicate"	332	-0.050
Insurers with NAIC data and data of "Rating of all health care"	334	-0.066
Insurers with NAIC data and data of "Rating of health plan"	334	-0.066
Insurers with NAIC data and data of "Rating of personal doctor"	333	-0.062
Insurers with NAIC data and data of "Rating of specialist"	304	-0.030

These initiatives include, for example, value-based purchasing, incentive arrangements, and withhold arrangements, all of which encourage Medicaid managed care to provide high-value care while controlling costs (CMS 2016b).

Aggregate rating 1: the average of the seven quality measures.

Aggregate rating 2: the average of six quality measures (without “Rating of specialist”).

Aggregate rating 3: the average of four quality measures—“Getting care quickly,” “Getting needed care,” “Rating of all health care,” and “Rating of health plan.”

From Tables 5–7, MLR has a positive effect on all the quality measures except for “Rating of specialist.” Specifically, MLR has a significant positive effect on “Getting needed care” and “Rating of all health care,” and an insignificant (but positive) effect on “Getting care quickly,” “How well doctors communicate,” “Rating of health plan,” and “Rating of personal doctor.” MLR has a significant positive effect on all three aggregate ratings. Therefore, especially based on the aggregate ratings, the results support the second alternative hypothesis that MLR has a positive effect on quality of care.

Similar to the minimum MLR requirement, it might be advisable to impose a minimum medical quality ratio (MQR) requirement for Medicaid insurers (and other insurers). On average, the MLR of the sample is around 87% (Table 3). The average score of the aggregate quality rating (of all the seven quality measures) is 77.4% (Table 2). If the minimum MQR is set at 75%, the minimum MLR could be reduced to 80% or lower (from the current required minimum 85%). Specifically, by the regression results, the coefficient of MLR is 3.582. Therefore, a decrease of 10 percentage points in MLR would only reduce the quality score by 0.3582 percentage point, other things being equal. Even though MLR has a significant positive effect on the aggregate quality ratings, the magnitude of the practical effect is actually very small. This implies that a minimum MLR requirement of 80% or 85% does not really make a huge difference on resulting quality ratings.¹⁴ Thus, 80% should be acceptable, especially when a higher MLR is restricting the ability to improve medical services efficiency (Harrington 2013).

The preceding analyses regarding the impact of the MLR and the medical services efficiency are based on the assumption that they are not highly correlated. To provide some support for this assumption, the correlation of the MLR and the medical services efficiency is presented in Table 8. It shows that the MLR and the medical services efficiency are negatively correlated but the correlation is extremely low. Therefore, for any specific year, an increase in medical services efficiency is not associated with a significant decrease in MLR, and vice versa.

7. CONCLUSIONS

Medicaid is the nation’s predominant health insurance program for low-income children, adults, seniors, and people with disabilities, and is the largest public health coverage in the United States. Medicaid is constantly evolving as policymakers strive to improve program value and outcomes through delivery system reforms, federal policy changes including those in the ACA, or other regulatory changes (Gifford et al. 2017). The recent CMS final rule on managed care in Medicaid and the Children’s Health Insurance Program (CHIP), issued on May 6, 2016, is the first major update to Medicaid and CHIP managed care regulations in more than a decade. It aligns key rules (such as the minimum MLR requirement) with those of other health insurance coverage programs, modernizes how states purchase managed care for beneficiaries, and strengthens the beneficiary experience, the quality improvement, and key consumer protections (CMS 2016a). In response to the new MLR standard and the CMS final rule on Medicaid quality of care, this research is designed to examine the quality of Medicaid managed care and its impacting factors, including MLR and efficiency. This research should provide some useful insights into Medicaid regulation, performance, and quality improvement.

In evaluating the quality of Medicaid managed care plans, this research uses the quality measures of customer experience and satisfaction generated by the health plan surveys of the CAHPS. The CAHPS surveys ask consumers and patients to report on and evaluate their health care experiences such as “Rating of all health care,” “Getting care quickly,” “Getting needed care,” and “Rating of health plan.” It is worth noting that, evaluated on its quality scores, Medicaid managed care is providing reasonable health care of acceptable quality. Medicaid managed care’s aggregate rating on all the seven quality measures is around 77% for the period 2007–2012 (where 100% is the best possible score).¹⁵

The goal of improved efficiency in health care should be a central feature of any reform effort. However, economic efficiency might result in lower quality of care and patient dissatisfaction. The results show that, based on the aggregate quality ratings, the medical services efficiency has an insignificant negative effect on the quality of care. This finding implies that there should be room to improve medical services efficiency without significantly reducing the quality of care. Medical services efficiency might be enhanced through some innovative health care payment and delivery models such as accountable care organizations (ACOs), value-based purchasing, and incentive and withhold arrangements, all of which encourage Medicaid managed care to provide high-value care while controlling costs. The results of this paper indicate that MLR has a significant positive effect on all three aggregate ratings. However, practically, the magnitude of the effect is actually very small. For example, a 10-percentage point decrease in MLR would only reduce the quality score by 0.3582 percentage point, other things

¹⁴Although, as pointed out by a reviewer, it can make a huge difference to state budgets that use public funds to pay these premiums.

¹⁵Since 2012, these scores have increased noticeably for Medicaid managed care; however, analysis of the new information is outside the scope of this article.

being equal. This implies that a minimum MLR requirement of 80% or 85% does not really make a large difference on resulting quality ratings. Accordingly, an MLR requirement of 80% should be acceptable, especially when a higher MLR is restricting the ability of the insurer to improve medical services efficiency.

As a caveat concerning the breadth of the conclusions, it is worth noting, again, that certain restrictions on the data were needed in order to perform the analysis reported herein (and the conclusions drawn therefrom). Our analysis was restricted to MCOs that filed annual statements with the NAIC (and not all Medicaid providers are considered to be insurers and hence these may not file annual statements¹⁶). Additionally, measures for ambulatory encounters and hospital patient days (which were needed for DEA efficiency analysis) were not available for the Title XXI Children's Health Insurance Program (CHIP) separately, so CHIP data were not included. Finally, consistent with the analysis of Palmer, Pettit, and McCulla (2018), health insurers with "specialized behavioral health plans or long-term services and supports plans" were excluded from this research, and insurers for which "premium revenues indicate a limited set of covered services", or "reported values appear to be influenced by unusual circumstances" were not included. While these data restrictions made the group of organizations compared and analyzed more homogeneous, conclusions are restricted to this important set of organizations.

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¹⁶Many of these noninsurer Medicaid MCOs are not-for-profit. Landon and Epstein (2001) examined nonprofit and for-profit Medicaid providers and concluded that not-for-profit and for-profit Medicaid plans are more similar than dissimilar in terms of management (although for-profit plans are more likely to use aggressive utilization review and have slightly less developed quality management systems).

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