University of Colorado Anschutz Medical Campus

The Impact of Increased Medicaid Payments for Primary Care Services on Access to Care for Medicaid Clients in Colorado

Final Report

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Executive Summary

The Health Care and Education Reconciliation Act amending the Patient Protection and Affordable Care Act of 2010 (ACA) required states' Medicaid programs to reimburse primary care providers (PCPs) at or above Medicare Part B rates in calendar years 2013 and 2014. States received 100% federal matching funds for the enhanced or "bump" payments that applied to selected primary care services from self-attested PCPs that were verified by state Medicaid agencies. The purpose of Section 1202 of the Health Care and Education Reconciliation Act was to help states achieve health policy objectives of improving Medicaid clients' access to primary care, increasing the number of PCPs accepting Medicaid, and building advanced models of primary care.

Colorado implemented the enhanced payments in July 2013, with payments retroactive to January 2013. The Colorado Department of Health Care Policy and Financing (the Department) established eligibility for over 3,700 self-attested providers by July 2013 with over 3,500 of those eligible to receive retroactive payments back to January 2013. The provisions of Section 1202 expired at the end of December 2014 at which time Colorado had attested over 4,300 PCPs to receive the enhanced payment rates.

Colorado is one of 15 states that elected to continue paying Medicare rates for the Section 1202 bump-eligible primary care services. The Colorado General Assembly approved the continuation and expansion of the rate bump from January 2015 through the end of State Fiscal Year (SFY) 2015-16 (June 30, 2016). As part of the Medicaid bump extension, the Department requested that the University of Colorado, School of Medicine conduct an analysis of the effect of the increased rates on access to care for Medicaid clients. This report presents the results from an analysis of the increased payments for bump-eligible services under Section 1202 from January 2013 to December 2014 and the Colorado extension of enhanced payments from January through July 2015.

This report addresses the question: Did the enhanced payments for primary care services under Section 1202 and the Colorado extension increase the number of PCPs participating in Medicaid and delivering these services to Medicaid clients, and improve Medicaid clients' access to primary care services? To answer this policy question, the report examines three provider-based measures and four client-based measures using Medicaid administrative and claims data from January 2010 through July 2015.

The analyses of both provider-based and client-based measures suggest that establishing increased payments to providers for selected primary care services did not significantly affect the realized access to care for Medicaid clients. Our analyses of the three provider-based measures did not reveal any significant impact of the enhanced primary care payments under either Section 1202 or the Colorado extension on the number of providers applying to deliver services under the Medicaid program or the number providing bump-eligible services to Medicaid clients as we did not find any significant deviations from historical trends. Our provider-level analysis of the number of bump-eligible visits in a month suggested a small increase ranging from 2 to 6 additional visits in months where providers that self-attested under Section 1202 were eligible to receive enhanced payments. Our analysis of the four client-based access to care measures did not reveal significant changes in any of these realized access to care measures in January or July of 2013, or in January 2015 when the Colorado extension went into effect. There did appear to be a change in the rates of emergency department visits for ambulatory care sensitive conditions in early 2014 that continued through July 2015, suggesting that access to primary care services for Medicaid clients is improving in Colorado. However, it is not clear if this improvement is due to the enhanced payments for primary care services or the cumulative effect of the multiple innovations the Colorado Medicaid program implemented over the last five years. It is important to also highlight that all of the client-based access to care measures remained stable even in the face of rapid growth in the Medicaid population, suggesting that the Colorado primary care system was able to accommodate this

growth while maintaining access to care at historical levels for both expansion and traditional Medicaid populations.

Overall, the results from the provider-based and client-based analyses clearly reveals that the primary care system in Colorado provided services to the State's rapidly increasing Medicaid client population while maintaining historical levels of access to primary care services. The evidence suggests that as the potential demand for these services increased, the primary care system delivered services in response to this increasing demand. While the analyses suggest that the enhanced payments did not significantly impact access to care for Medicaid clients, this does not necessarily imply that the Medicaid bump did not contribute to the response of the primary care system to the rapidly increasing Medicaid population. The provider-level analysis indicates that attested providers increased the number of bump-eligible services they delivered, on average, by 2 to 6 visits per month when they were attested to receive the higher payments. In addition, because the most rapid growth in the Medicaid beneficiary population occurred in early 2014 and the rate of increase has fallen back to what can be considered historical norms, assessing the impact of the Colorado extension of the enhanced payments with only seven months of data is preliminary. Moreover, the combination of other innovations that is transforming the Medicaid program in Colorado introduces added factors that potentially confound the impact of enhanced payments for the bump-eligible primary care services. With these significant caveats, the preliminary results suggest the extension of the enhanced payments is resulting in attested providers maintaining the 2 to 6 additional bump-eligible visits in a month and not significantly influencing the delivery of bump-eligible services for providers that did not self-attest under Section 1202.

1. Introduction

Two of the key components in the Patient Protection and Affordable Care Act of 2010 (ACA) designed to increase health care access among low-income populations were the provision of enhanced federal funding to expand state Medicaid programs and the establishment of the Community Health Center Fund to increase the capacity of all types of community health centers, which are also known as Federally Qualified Health Centers (FQHCs). As a result of the United States Supreme Court Ruling in *National Federation of Independent Business v. Sebelius*, the ACA provided states the option to expand Medicaid eligibility to adults with incomes at or below 138% percent of the federal poverty line, which is just over $16,000 annually for a single adult without dependents. Among the 27 states that had implemented the Medicaid expansion and were covering newly eligible adults in January 2015, Medicaid and CHIP enrollment rose by 26.1% between the July-September 2013 baseline period and January 2015. States that had not expanded Medicaid reported an enrollment increase of approximately 7.8% during the same time period.[1] Colorado was among the first states to expanded its Medicaid program and experienced an enrollment increase of 52.5% between the July-September 2013 baseline period and January 2015.[1]

The Community Health Center Fund provided $11 billion over a 5 year period for the operation, expansion, and construction of FQHCs in all States and Territories. This supplemental funding in combination with annual appropriations for community health centers increased annual funding for community health centers from $1.3 billion in 2002 to $4.9 billion in 2015. In federal Fiscal Year 2015 (FY15), the Community Health Center Fund accounted for 72% of federal funding for health centers. Colorado received over $141 million from the Community Health Center Fund supporting the expansion of community health center services and providing increased access to care for Medicaid clients and other low income populations.[2] This increased funding supported the expansion of community health center services in Colorado resulting in an increase from serving 458,075 patients in 2010 to 519,975 in 2014, including an increase in the number of patients served with Medicaid coverage.

Background on Section 1202

Another key component of the ACA is Section 1202 of the Health Care and Education Reconciliation Act that amended the ACA to require that Medicaid reimburse primary care providers (PCPs) at or above Medicare Part B rates in calendar years 2013 and 2014. This enhanced or "bump" payment applied to selected primary care (bump-eligible) services rendered by an attested physician with a specialty designation of family medicine, general internal medicine, or pediatric medicine. To receive the enhanced payment, providers were required to self-attest as a provider of primary care services by submitting an attestation form to the state Medicaid agency. Providers with other specialty designations were able to attest for the increased payment if they could document that 60% or more of their Medicaid claims in the prior year were for the specified evaluation and management (E&M) and vaccination codes. The purpose of this enhanced funding was to help states achieve multiple national and local health policy objectives including improving Medicaid clients' access to quality primary care, increasing the number of PCPs accepting Medicaid, and building more advanced models of primary care.[3]

States received 100% federal matching funds for the increased payments in 2013 and 2014. The size of the increase varied both across states and across the specific bump-eligible primary care services. An Urban Institute analysis concluded that, on average, payments for primary care services would increase by 73% in 2013 compared to payment levels in 2012. Across states, the increase ranged from no increase in two states that were already paying Medicare rates or above to more than a 100% increase in six states.[4] As a result of these increases the Medicaid and CHIP Payment and Access Commission reported that, as of January 2015, $7.1 billion in payment enhancements were disbursed to states with a forecasted total of

approximately $12 billion in enhanced payments being disbursed over the two years of the full federal matching rate.[5]

While the concept of creating parity between Medicare and Medicaid payments for primary care services appeared to be a straightforward rate increase, the implementation of Section 1202 was significantly more complex due to some of its provisions. States had to modify their state plan, process self-attestations from providers including eligibility verifications, work with Medicaid managed care organizations to identify eligible providers in their networks, and implement a separate payment mechanism to pay eligible providers the enhanced rate. These provisions in combination with the temporary nature of the payment bump may have attenuated the effect of the enhanced primary care payments on providers' willingness to incur the costs associated with self-attestation to become eligible to receive the increased payments, thereby limiting the policy's impact on the number of PCPs serving Medicaid clients and tempering the intended impact on increasing Medicaid clients' access to care. The self-attestation requirement also required states to inform providers of the requirements to receive the enhanced payments making awareness of the Section 1202 payment bump another potential implementation issue that is likely to further temper the potential impact on PCPs decisions to delivery services to Medicaid clients.

Colorado received approval of its state plan amendment for the enhanced payments in July 2013, with payments retroactive to January 2013. The resulting increase in payment rates for the bump-eligible services in Colorado ranged from just over 1% to almost 70%, depending upon the payment level in 2012. On average, taking into account the relative number of services provided, payment rates increased by approximately 30% for all bump-eligible services.

The Colorado Department of Health Care Policy and Financing (the Department) was able to establish eligibility for over 3,700 providers that self-attested by the time the state plan amendment was approved with over 3,500 of those eligible to receive retroactive payments back to January 2013. The state continued to accept attestations and determine eligibility for the increased payment through December 2014, at which point over 4,200 providers were eligible to receive the 1202 payment bump. Given the 1202 bump was not a general rate increase, the Department implemented a payment mechanism that paid attested providers quarterly payments for all of the bump-eligible primary care visits during a calendar quarter. Specifically, both attested and non-attested providers received the established Medicaid payment for each "bump-eligible" claim at the time the service was rendered and attested providers received a supplemental payment four times per year equal to the difference between the Medicare payment and the established Medicaid payment for each bump-eligible service in the prior three-months.

The provisions of Section 1202 expired at the end of December 2014 and, as of January 1, 2015, Colorado is one of 15 states electing to fully or partially continue paying Medicare rates for bump-eligible primary care services.[6] The Colorado General Assembly approved the continuation and expansion of the rate bump from January 2015 through the end of State Fiscal Year (SFY) 2015-16. This extension of the rate bump was possible because of an unexpected increase in Colorado's Federal Medical Assistance Percentage (FMAP) in FY15. The General Assembly did not extend the rate bump beyond June 30, 2016 because of uncertainty regarding future FMAP rates. The Colorado extension is estimated to increase annual payments to all providers for all bump-eligible services between $125 and $150 million, which includes a combination of federal and state funds as the increased payments are eligible for FMAP matching.

As noted above, the self-attestation and limitation of dispersing the increased payments for bump-eligible services only to attested providers created administrative costs for both the Department and providers. As part of the extension in Colorado, the Department proposed and the General Assembly approved the elimination of the self-attestation requirement. This expanded the availability of the increased payments to more providers that deliver primary care services to Medicaid clients, including advanced practice

nurses who independently practice. These changes also permitted the Department to pay the increased rates for bump-eligible services on a real-time, per claim basis rather than retrospectively on a quarterly basis. These changes were designed to address the potential effect-limiting elements of Section 1202 identified above, and to maximize the incentives for a broader spectrum of providers to increase their Medicaid panels and to improve access to care for Medicaid clients.

The approval of the increased payments extension also included a provision to study the effect of the rate increase. To assess the extent to which the increase in Medicaid rates for primary care services (as specified in Section 1202 and extended by the Colorado General Assembly) achieved its policy objectives, the Department requested that the University of Colorado, School of Medicine conduct an analysis of the association between the increased Medicaid rates and access to care for Medicaid clients using Medicaid claims data. This report presents the results from an analysis of the increased Medicaid primary care payments over the 24 months (January 2013 – December 2014) of the Section 1202 payment increase, which included the self-attestation requirements and the quarterly payment mechanism, plus the results from analysis of the first 6 months of the Colorado extension after elimination of the attestation requirement and the corresponding expansion of the providers that received the increased payment on a claim-by-claim basis. The analysis reported here examines the impact of the primary care payment bump using Medicaid administrative and claims data for the period January 2010 through July 2015 with a focus on three key time points: (1) January 2013 when Section 1202 first took effect; (2) July 2013 when the Colorado State Plan Amendment was approved and the first quarterly payments to attested providers were disbursed; and, (3) January 2015 when the Colorado extension became effective.

The Policy Question

Section 1202 and the Colorado extension of the Medicaid primary care payment bump were designed to address three major public policy objectives:

1. Improve access to quality primary care for Medicaid clients.
2. Increase the number of primary care providers accepting Medicaid and serving Medicaid clients.
3. Encourage the adoption of advanced models of primary care delivery.

This report addresses the policy question: *Did the increased payment for Evaluation and Management (E&M) and other bump-eligible procedure codes achieve the intended policy objectives?* While the first two objectives can be assessed using Medicaid administrative and claims data maintained by the Department, evaluating the last objective requires collection of data from primary care providers about the use of advanced models of care delivery that is beyond the scope of this project.

Focusing on the first two policy objectives, there are two ways in which the enhanced primary care payments can potentially affect access to care for Medicaid clients:

1. Increasing the number of providers delivering primary care services to Medicaid clients.
2. Increasing the number of bump-eligible primary care visits among providers who were already serving Medicaid clients.

The analysis of Medicaid administrative and claims data below directly addresses both of these mechanisms of action, as well as examining the extent to which any impact via either or both of these mechanisms may have affected access to primary care services for Medicaid clients. Specifically, using Medicaid administrative and claims data from January 2010 through July 2015 the analysis examines three provider-based measures and four Medicaid client-based measures to assess the extent to which parity in Medicare and Medicaid payments for primary care services achieved its primary policy objectives.

Before presenting the results of the analysis, the next section provides a brief overview of previous studies of the Section 1202 payment increase. This is followed by a description of the measures used in the analysis to assess the impact of the increased payments for bump-eligible services on Medicaid

clients' access to care and the potential response of providers in delivering bump-eligible primary care services. A description of the data and methods used in the analysis and a discussion highlighting a number of important contextual factors that must be taken into account in interpreting the analysis results follows. The report concludes with a presentation of the results and some concluding statements.

2. Prior Studies of Payment Increases and Section 1202

Very little is known about the effect of parity between Medicare and Medicaid payment rates for the primary care services identified in Section 1202 on access to primary care for Medicaid clients and provider participation in Medicaid. One reason for this lack of evidence is the cost of collecting the type of data traditionally used to measure access to care for Medicaid clients. Some of the most widely used measures of access to care are based on two types of primary data collection:

1. Large scale surveys, such as the Colorado Health Access Survey and surveys of providers.
2. Simulated patient ("secret shopper") surveys of primary care providers.

Both of these approaches have been used to study access to care and the effects of payment increases on patient access to care. There are several older studies that have examined the relationship between Medicaid payment rates and provider participation in Medicaid and a small number that have examined this relationship in the context of Section 1202. There are even fewer studies that have used claims data instead of survey data to measure access to care and provider responses to payment increases for specific services.

Among the studies using population surveys to measure access to care and assess the role of provider payment levels on patient access, several recent studies used data from the National Health Interview Survey (NHIS). One such study using NHIS data from 1997 to 2009 found increasing Medicaid fees were associated with increases in the number of physician visits per year among children in all socio-economic groups, although this relationship was not statistically significantly. This same study found that increasing Medicaid fees was related to a reduction in non-cost-related access problems among children of all income levels, suggesting that increases in Medicaid provider fees are associated with some improvements in indicators of access to care.[7] In contrast, when reductions were made to Medicaid provider fees another study found statistically significant reductions in the number of visits for Medicaid patients compared to privately insured patients. This study also found that these fee reductions corresponded to less care provided in physician offices, and more care occurring in hospital emergency and outpatient departments. While these two findings suggest a relationship between fee reductions and lower access to care, this study also found a higher number of baseline primary care visits for Medicaid patients compared to those who were privately insured, suggesting that the lower payment levels did not necessarily reduce access for Medicaid clients to levels below those of privately insured patients.[8]

Other studies of the relationship between provider payment levels and access to care have used data from the Medical Expenditure Panel Survey (MEPS). One study using MEPS data from 2003 and 2008 investigated the relationship between state Medicaid payment rates for provider services and the use of five US Preventative Services Task Force-recommended preventive services (breast cancer, cervical cancer, cholesterol, blood pressure, and colorectal cancer screenings) in Medicaid populations. The findings suggested that there was no association between higher Medicaid payment rates and receipt of these services. The study concluded that higher levels of payments for Medicaid preventive care services are not necessarily an effective strategy to increase the receipt of preventive services in the Medicaid population.[9]

Another approach that has been used recently to assess the effects of the Section 1202 bump on Medicaid clients' access to primary care is surveys of healthcare systems and physician practices. This approach has been used recently in a report from Washington State to assess the willingness of PCPs to continue

providing care for Medicaid patients without the increased payment. While willingness to provide this care in spite of the possible financial strain was high among both large healthcare organizations and primary care physicians in smaller practices, others reported that reverting payments back to the prior Medicaid amount would cause them to change how their practice handles Medicaid patients. Though nearly 75% of PCPs in smaller practices were willing to provide care, they reported that they would stop or limit their acceptance of new Medicaid patients and/or stop or limit care for current Medicaid patients if the payment increase ended in 2015. The vast majority of providers indicated that higher reimbursement rates could encourage them to continue seeing current Medicaid patients or to accept new Medicaid patients.[10] The Colorado Medical Society recently conducted a similar survey of its members.[11] On the survey, 2% of physician respondents reported they started accepting Medicaid because of the rate increase and another 37% reported they increased the number of Medicaid clients served primarily by increasing the number of available Medicaid appointments. Responses to questions regarding the end of the enhanced payments suggested that a similar number would reduce the number of Medicaid patients (37%) and suggested that another 23% would stop participating in Medicaid altogether.

In addition to population and provider surveys, another widely used survey-based approach to measure access to care for Medicaid clients uses a "simulated patient" or "secret shopper" approach where trained interviewers attempt to schedule primary care appointments with a sample of providers posing either as a Medicaid client or someone with private insurance coverage. A recent study by Polsky and colleagues used this approach to measure the availability of and waiting time for a new-patient appointment with primary care providers in 10 states before and after the Section 1202 increase was implemented.[12] Secret shopper data were collected during two periods, November 2012 through March 2013 (the pre- period) and May 2014 through July 2014 (the post- period). Analysis of the survey data found that the availability of primary care appointments in the Medicaid group increased from 58.7% to 66.4% while there was essentially no change in the availability of appointments for privately insured secret shoppers. In addition, waiting time for a new-patient appointment remained stable over time for both Medicaid and privately insured patients. The results also suggested that the states with the largest increases in appointment availability tended to be those with the largest increases in Medicaid reimbursements, with an estimated increase of 1.25% in availability per 10% increase in reimbursement rate ($P = 0.03$). This association was not seen in the private insurance group.

There are a limited number of studies using claims-based analyses of access to care, with those published in the last 5 years primarily focused on the topic of child and adolescent access to oral health services. However, a July 2014 analysis of claims submitted by physician practices that are voluntarily participating in an athenahealth™ data network reported that PCPs in Medicaid expansion states saw a substantial increase in the proportion of adult visits with participating providers by Medicaid patients following expansion from 12.3% in December 2013 to 15.6% in May 2014. PCPs in non-expansion states saw similar trends in their practices, though to a lesser degree, from 5.9% to 6.3%.[13] This study focused on the overall relationship between the ACA and Medicaid access, and did not examine any aspects of Section 1202 or relate any of the findings to payment amounts for primary care services.

To our knowledge, this is the first study to use Medicaid administrative and claims data, to analyze the impact of enhanced payments for primary care services on provider participation in Medicaid and realized access to primary care services for Medicaid clients. Although a recent report by NORC at the University of Chicago raised some concerns about cross-state comparisons of claims-based access to care measures, the report provided more positive recommendations about claims-based measures of realized access to care within a state.[14] The report concluded that access to care measures that are based on a single state's Medicaid claims data can provide a reliable, valid, and unbiased alternative to survey data in measuring changes over time in access to care for Medicaid clients.

3. Administrative- and Claims-Based Measures of Access to Care for Medicaid Clients

There is a long history of using provider participation in Medicaid as a proxy measure of access to care for Medicaid clients. Building on this history we calculated two measures of provider participation in Medicaid using administrative data to assess the extent to which the Section 1202 increase in primary care payments and the Colorado extension might have affected provider participation. In addition, we also examined two types of claims-based realized access to care measures covering at least two years before the Section 1202 payment bump was initiated and 30 months after the enhanced payments were first available to primary care providers. The first type of realized access to care directly examines the two primary mechanisms of action of the payment bump by examining primary care providers' delivery of bump-eligible healthcare services to Medicaid clients. The second type of claims-based realized access to care measures consists of four client-based measures that are commonly used to evaluate access to care:

1. A measure of the number of emergency department visits for ambulatory care sensitive conditions.
2. A Healthcare Effectiveness Data and Information Set (HEDIS) Adult Access to Preventive Care (AAP) Measure for adult beneficiaries who were eligible for Medicaid in 11 of the previous 12 months.
3. A HEDIS Children and Adolescents' Access to Primary Care Practitioners (CAP) Measure for beneficiaries aged 1 to 19 years who were eligible for Medicaid in 11 of the previous 12 months.
4. A continuity of care measure for adult beneficiaries, calculated in 6 month periods among adult Medicaid clients that were eligible for Medicaid in all 6 months of each period.

This section briefly describes these measures.

Provider Participation in Medicaid

The Section 1202 increase in Medicaid primary care payment rates could affect access to care for Medicaid clients by increasing the number of providers delivering primary care services to Medicaid clients, or increasing the number of bump-eligible primary care visits among providers who were already serving Medicaid clients, or both. To provide services and receive payment for these services Medicaid providers must apply to the Department and become active Medicaid providers. Information on active providers, as well as inactive providers, is maintained by the Department including information on the start and end dates of all active periods of provider participation in Medicaid.

To assess the extent to which the increased Medicaid payment rates under Section 1202 and the Colorado extension may have resulted in more providers become active in Medicaid, we calculated two monthly measures of newly activated providers using the beginning date of the first time a provider is recorded as active in the administrative provider activation data file. The first measure calculated the total number of all providers that were classified as a physician, non-physician provider, osteopath, and physician assistant or family/pediatric nurse practitioner that were newly active in a given month from January 2010 through July 2015. This measure is not limited to primary care providers and to focus on all providers that could potentially receive enhanced primary care payments we also calculated the number of newly active providers in a month limiting the measure to providers that had at least one bump-eligible service claim after they were first active in Medicaid.

Provider-Based Realized Care Measures

Once a provider is actively participating in Medicaid, the increased primary care payment rates could affect realized access to care for Medicaid clients by increasing the number of providers delivering primary care services to Medicaid clients, or by increasing the number of bump-eligible primary care visits among providers who were already serving Medicaid clients, or both. To assess the extent to which either or both of these effects were associated with the timing of the increased Medicaid payment rates we

calculated the number of bump-eligible primary care visits in a month for every active Medicaid provider from January 2010 through July 2015.

Two types of adjustments were made to the provider-based realized care measures to account for bump-eligible visits provided by FQHCs, Rural Health Clinics (RHCs), and Emergency Rooms. First, the calculations were limited to visits where a rendering provider was identified on a claim, which resulted in the exclusion of slightly more than 20% of claims for bump-eligible visits where the rendering provider identifier was missing. These excluded bump-eligible visits were appropriately claimed using an institutional claim form that does not include a rendering provider field effectively excluding all visits to providers working at FQHCs and RHCs at the time of the visit. Under the provisions of Section 1202 and the Colorado extension, primary care services associated with these claim types were not eligible for the supplemental payment because of the different payment model used for these types of providers and service locations. Second, both Section 1202 and the Colorado extension included the procedure codes that are most frequently used by hospital-based Emergency Rooms to bill for E&M services. While the attestation requirement limited the number of providers that received the increased payments for these E&M services under Section 1202, the elimination of this requirement in the Colorado extension resulted in increased payments to all providers that used these codes, including providers working in Emergency Rooms. To explore the implications of excluding bump-eligible visits delivered in an Emergency Room setting, we calculated the provider-based realized care measures with and without these visits. The results excluding Emergency Room visits are presented in Section 6 and the findings that included Emergency Room visit are presented in Appendix 1.

To assess both potential effects of the increased payment rates, we calculate two measures of these monthly visit counts for providers. One measure examines the number of providers that exceeded a threshold number of bump-eligible visits in a calendar month at multiple thresholds. To assess the potential effect of increasing the number of providers delivering these services to Medicaid clients we calculated the number of providers with one or more bump-eligible visit in a month. To assess the potential effect of increasing the number of bump-eligible visits in a month we separately calculated the number of providers that had 6 or more visits, 16 or more visits, and 32 or more visits of this type in a month. The selection of these threshold values was based on the distribution of monthly bump-eligible visits from January 2010 through December 2012 among providers that were eventually attested and eligible to receive the increased payment rates under Section 1202. Specifically, the first quartile of this distribution is 6 visits, the median is 16 visits, and the mean is 32.8 visits. Separate measures were calculated for providers that were ever self-attested and approved to receive the increased payments before December 2014 and providers that never self-attested. The second measure directly quantifies the number of bump-eligible visits in a month for all providers that delivered at least one bump-eligible visit to a Medicaid client during any period the provider was active in Medicaid from January 2010 through July 2015. Statistical models are used to analyze this measure and the model specification distinguishes between providers that were attested to receive increased payments in each month from January 2013 through December 2014, as well as providers that never attested to receive Section 1202 payments.

Client-Based Measures: Ambulatory Care Sensitive Condition Emergency Department Use[15]

There are several client-/patient-based access to care measures calculated using claims data that can serve as proxy measures for assessing potential barriers to primary care services. Some of the most widely used measures are the composite measures included as part of the Agency for Healthcare Research and Quality (AHRQ) Prevention Quality Indicators (PQIs). The PQIs are a set of population-level measures that can be calculated from hospital and emergency department claims data to identify hospital admissions or visits to an emergency department for "ambulatory care sensitive conditions" (ACSC), which are conditions that can often be managed in the outpatient setting to prevent complications or more severe acute disease exacerbations. The premise for these ACSC is that high levels of access to quality primary

care greatly reduces the potential need for hospitalizations or visits to the emergency department for these conditions. High or increasing rates of hospital admissions or emergency department visits for ACSC measures are suggestive of poor or declining access to care for the population of interest.

The PQIs are a set of 14 population-level measures of ACSC for adults (aged 18 years and older). In addition to the 14 individual measures, AHRQ has created three composite measures that have been widely used to identify potential, actual, or perceived barriers of access to primary care and other community-based outpatient services. PQI #90 combines 12 of the 14 measures to provide an overall composite measure that can be used to indicate barriers to accessing primary care services at a population level, such as adult Medicaid clients. PQI #92 combines 9 of the 12 measures included in PQI #90 to provide an overall composite measure of ambulatory care management of chronic conditions in an adult population. PQI #91 combines 3 of the 12 measures included in PQI #90 to focus on the management of 3 acute conditions (dehydration, bacterial pneumonia, and urinary tract infections) in adult populations by ambulatory primary care and other community-based services. We primarily focused our analysis on PQI #92 to focus on management of chronic conditions, but also examined the other two composite measures. The specifications for these composite measures are described in detail on the AHRQ web site.[15]

While the PQIs were developed for use with hospital discharge claims, we calculated these measures for emergency department encounters whether or not the emergency department encounter resulted in a hospital admission. We calculated slightly modified composite PQI measures because of an absence of some procedure codes for the emergency department encounters. To maintain comparability with the other client-based measures, the PQI composite measures were calculated on a monthly basis from January 2011 through July 2015 resulting in a time series of 55 observations. As these measures are calculated for a defined population, we required reliable measures of the Medicaid eligible population and our eligibility information was more reliable beginning in January 2010. We calculated the modified PQI #92 composite measure for four different Medicaid client populations:

1. All adult Medicaid clients eligible in a month, excluding Medicare and Medicaid eligible and Child Health Plan Plus (CHP+) clients.
2. All adult Medicaid clients eligible in a month that were enrolled in Medicaid for 11 of the previous 12 months, excluding Medicare and Medicaid eligible and Child Health Plan Plus (CHP+) clients.
3. All adult Medicaid clients eligible in a month, excluding Medicare and Medicaid eligible, Child Health Plan Plus (CHP+), and Medicaid expansion clients.
4. All adult Medicaid clients eligible in a month that were enrolled in Medicaid for 11 of the previous 12 months, excluding Medicare and Medicaid eligible, Child Health Plan Plus (CHP+) clients, and Medicaid expansion clients.

We examined these measures for subgroups of the population based on demographics, including age and different geographic areas of the State using the reported county of the client's residence; however, the time trends were very similar for each of these subgroups and we only report the statewide measure below.

Client-Based Measures: HEDIS Adult Access to Preventive Care (AAP)[16]

The most common types of claims-based access to care measures focus on the actual use of preventive care services by health plan beneficiaries and for this reason are often referred to as realized access to care measures. Several of these measures of access to care have been incorporated in the Healthcare Effectiveness Data and Information Set (HEDIS). One of the HEDIS access to care measures we examined is the Adult Access to Preventive Care (AAP) measure. This measure calculates the percentage of adult Medicaid clients (aged 20 years or older) with one or more ambulatory primary or preventive care visit in the previous 12-month time period. This measure is widely used by health plans, payers, and

other stakeholders to measure access to care for adults, as a lack of routine primary or preventive care services may be suggestive of barriers that should be addressed to improve adult access to care.

We implemented, with some minor modifications, the AAP measure as defined by HEDIS and documented in the National Quality Measures Clearinghouse[16] for Medicaid and Medicare members. One modification was the reporting period. HEDIS specifies that the measure be calculated at the end of each calendar or plan year and we calculated the measure every month. The HEDIS measure for Medicare and Medicaid members also requires the member to have been enrolled for 11 of the past 12 months. Some implementations of this HEDIS measure also require that the primary or preventive care visit be with a primary or preventive care provider. However, one limitation of our data was the uncertainty of being able to determine if a specific provider was a primary or preventive care provider and as a result we did not exclude any primary or preventive care visits to providers because of the provider's specialty codes.

We calculated the HEDIS AAP measure for the same four Medicaid populations that were used in calculating the PQI measures based on eligibility in a given month versus Medicaid coverage in 11 of the previous 12 months and including versus excluding the expansion population. The measures reported below are calculated for adults who were eligible for Medicaid in 11 of the previous 12 months and are measured monthly starting with January 2011 through July 2015, resulting in a time series of 55 observations. Our analysis of the Medicaid eligibility data, and verified by the Department, indicated that periods of eligibility were missing for a significant number of clients prior to January 2010. The analysis that included all clients in the population eligible in a month displayed similar trends but was highly variable because of churning on and off of Medicaid; as such, we do not report these results below due to this variability that obscures the general time trends. We calculated the AAP measure for subgroups of Medicaid clients based on demographic characteristics, such as age groups for clients age 20 to 44; clients age 45 to 64; and clients 65 and older. The time trends were very similar for the subgroups and we only report the overall measure for the adult client population that was covered by Medicaid in 11 of the previous 12 months with and without the inclusion of the expansion population.

Client-Based Measures: HEDIS Children and Adolescents' Access to Primary Care Practitioners (CAP)[17] Measure

A commonly used access to care measure for children and adolescents is the HEDIS Children and Adolescents' Access to Primary Care Practitioners (CAP) measure. This measure calculates the percentage of children aged 12 months to 6 years who had an ambulatory primary or preventive care visit during the previous 12 months (measurement year) and children and adolescents 7 to 19 years of age who had an ambulatory primary or preventive care visit during the measurement year or the year prior to the measurement year. We calculated the CAP measure as defined by HEDIS and documented in the National Quality Measures Clearinghouse[17] with some of the same modifications described above for the AAP measure. First, we calculated the measure on a monthly basis rather than annual, as our objective was to identify changes over time and assess if the bump in payment rates was associated with changes in access to care. Second, we included all visits with an identified ambulatory primary or preventive services code because of the limitation in determining if the provider delivering the service was a primary care provider. In addition, we modified the measure for adolescents to consider only visits in the prior 12 months rather than the 24 month window used by HEDIS. This modification potentially provides a more sensitive measure of access to care as it requires a more recent primary care visit.

Similar to the AAP measure, we calculated the CAP measures for different Medicaid client populations, such as with and without the expansion population included in the calculations. As there are very few Medicaid clients under the age of 19 that are covered as part of the expansion population, the results presented below include all children in the measures even if they were eligible for Medicaid as part of the expansion. We calculated the CAP measure for four age ranges: (1) 12 to 24 months; (2) 25 months to 6

years; (3) 7 to 11 years; and (4) 12 to 19 years for children and adolescents that were enrolled in 11 of the previous 12 months. We report measures for each of the four age categories for the 55 months from January 2011 through July 2015.

Client-Based Measures: Continuity of Primary Care Services Measure

Improved access to primary care services may also increase the continuity of primary and preventive care services. While there is an extensive literature on measures of continuity of care and numerous continuity of care indices in the published literature, there is no consensus among researchers about what should comprise a comprehensive continuity of care index.[18] Density indices, such as the Usual Provider Continuity Index (UPC), are most commonly used because of their ease of calculation with claims data and are widely viewed as intuitively appealing to providers.

As continuity of primary care services could reflect an effect of the increased payment for primary care services, we measured a modified version of the UPC index calculating the percentage of primary care services rendered by a client's "usual provider of care" within a 6-month time period. We defined the usual provider of care as the provider delivering the most number of primary care visits in the specified time period using the rendering provider identifier. We modified the standard UPC definition to use the same Current Procedural Terminology (CPT®) codes as used in the HEDIS AAP definition. Specifically, we calculated the number of these encounters with the usual provider divided by the total number of these encounters in the time period. We also indicated if the usual provider during that time period was ever an attested provider for purposes of receiving Section 1202 increased payments before the Colorado bump extension.

We calculated the modified UPC measure for adults only and calculated versions of this measure for Medicaid clients aged 20 to 44; aged 45 to 64; and aged 65 years and older. In contrast with the other measures that were calculated on a monthly basis, this measure was calculated on a semi-annual basis beginning with the first six months of calendar year 2010 (January – June) through the first six months (January – June) of 2015. In addition, as there is not a standard approach to account for individuals who do not have any relevant visits, we calculated these measures only for clients with at least one eligible visit. As the UPC measure did not differ for the three age categories, the results are only presented for all adults with results displayed for all providers and separately where the usual provider was ever attested to receive the increased Section 1202 payments.

4. Data and Methods

The Department provided the Medicaid administrative and claims data needed to calculate both the provider-based and client-based measures to assess the potential impact of the Section 1202 payment increase and the Colorado extension of these increased rates for primary care services for Colorado Medicaid clients. Four types of data files were provided covering the period July 2008 through July 2015. One type of data provided information on Medicaid clients for all eligibility categories. These data files were used to determine whether a client was eligible to receive Medicaid services in each month from July 2008 through July 2015 and the program component under which a client qualified for Medicaid in each month. The second type of data provided information on healthcare providers that were eligible to participate as an active Medicaid provider in a month and to identify the providers that self-attested to be eligible to receive the increased payment for primary care services under Section 1202. As with clients, for each provider we determined if they were an active Medicaid provider that was eligible to receive payments from Medicaid for each month from July 2008 through July 2015, whether they ever self-attested to be eligible to receive the increased payments for bump-eligible services, and the months they were eligible to receive increased payments under Section 1202 from January 2013 through December

2014. The third type of data provided information on institutional claims for services, including acute care hospitals, emergency departments, nursing facilities, and other claims for services paid to facilities. Finally, the fourth type of data included all claims for professional services.

These four types of data were combined to calculate the provider-based and client-based measures discussed above. Although data were provided from July 2008, a preliminary analysis of the number of Medicaid-eligible clients revealed there was missing information on clients with multiple periods of eligibility. A comparison of the number of clients calculated from the beneficiary eligibility files and published information from archived Department reports suggested that missing periods of client eligibility in our data were minimal starting in January 2010. We confirmed this limitation of our eligibility data files with Department analysts and, as such, limited our analysis to the 67 months from January 2010 through July 2015. While multiple periods of eligibility to receive Medicaid payments did not create issues with the provider files, a preliminary analysis suggested that the healthcare specialty codes were not reliable enough to use in our analysis of the access to care measures, which required us to modify the HEDIS access to care measures as described above.

The provider-based and client-based measures were first analyzed using graphical methods for the provider participation measures, the monthly number of providers with bump-eligible visits exceeding each of the four thresholds, and all four of the client-based measures. Graphical methods focused on a visual examination of time series plots of each measure with particular attention focused on potential changes in these plots around January and July 2013 to assess the extent to which there are changes in time trends around key dates in the implementation of the Section 1202 payment increase and in January 2015 to examine if there were any notable changes when the Colorado extension became effective. Specifically, we assessed the extent to which there are interruptions in time trends in January 2013, when the payment bump was first in effect, and July 2013 when the Colorado State Plan Amendment for providing the increase payments was approved by CMS, which also corresponded to the distribution of the first lump-sum payments for bump-eligible visits from January through June 2013 to attested providers. Similarly, we looked for any interruptions in the time series plots around January 2015 when the Colorado extension with its changes in program features went into effect; however, we only have seven months of data following this change limiting the extent to which long-lasting interruptions in the time trends of these measures can be detected.

If the graphical analysis suggested that a measure varied over time, we applied time-series regression models to these measures. Specifically, the analysis applied an interrupted time series approach to assess the extent to which there are changes in time trends around the three key dates in the implementation of the Section 1202 payment increase and the Colorado extension. Specifically, the models allowed for interruptions in time trends in January 2013, July 2013 and January 2015 when the Colorado extension of the payment bump replaced the Section 1202 program.

The interrupted time-series models also included a monthly factor to account for seasonal variation in the measures, a non-linear time trend for all measures, and for the provider-based measures monthly counts of the number of eligible Medicaid clients broken down into seven categories. Specifically, the seven categories of client counts were derived from eligibility category codes and are: (1) Medicare and Medicaid eligible (MME); (2) Medicaid with other insurance; (3) Non-expansion MAGI adults, caretaker relatives, pregnant women and children including TANF and Colorado Works eligibility codes; (4) Baby Care Program (BCP); (5) Child Health Plan Plus (CHP+); (6) Expansion MAGI adults; and (7) other

eligibility categories.[i] The inclusion of the number of medical assistance clients in each month in these seven categories for the provider-based measures was needed to account for any potential changes in demand for primary care services due to the substantial growth in the overall number of Medicaid clients during this period. The client-based access to care measures are calculated as rates among clients and, therefore, we did not include monthly client counts in the time-series regression models for these measures.

In addition, for the provider-based realized access to care measures we apply generalized estimating equation models to estimate two separate effects of the increased payment on the number of bump-eligible visits in a month depending on whether the month was in the period from January 2013 through December 2014 or from January 2015 through July 2015. The first effect provides an estimate of the impact of the Section 1202 program on the number of bump-eligible visits in a month for providers that were attested in that month. The second effect provides an estimate of the impact of the Colorado extension on the number of bump-eligible visits in a month for all providers because the extended program dropped the self-attestation requirement. We estimated both linear and Poisson count models that relate the number of bump-eligible visits in a month to multiple factors. Two-stage models are also estimated where the first stage estimates the probability that a provider has one or more bump-eligible visits in a month and the second stage only includes counts for providers that had one or more bump-eligible visits in the month. These two-stage models are widely used and for the Poisson count models are often referred to as Zero-Inflated Poisson count models. In addition, to account for potential systematic differences between providers that were ever attested under the Section 1202 program and attested in a specific month, we applied instrumental variable methods in the linear count models. All of the generalized estimating equation models included controls for seasonality, general time trends, the number of Medicaid clients in each of the seven eligibility categories, and whether the provider was an established or new Medicaid provider in a month. The inclusion of these other potentially confounding factors helped to isolate the potential impact of the payment policy changes on the number of providers delivering primary care services to Medicaid clients and the number of bump-eligible primary care visits.

5. Contextual Considerations

Before discussing the analysis results assessing the potential effects of increased Medicaid payments for bump-eligible primary care visits, it is important to place these findings within the context of the overall Medicaid program in Colorado. Colorado experienced a significant increase in its Medicaid client population beginning in 2008 and was among the first states that expanded eligibility for Medicaid. In addition, Colorado has adopted a number of Medicaid innovations over the last several years. In 2009 the Colorado Health Care Affordability Act enabled the state to expand Medicaid and Child Health Plan Plus (CHP+) coverage for children, pregnant women and low-income parents. Moreover, on a limited basis, starting in 2012 coverage was extended to adults without dependent children and working people with disabilities, which encompassed some of the populations that are covered under the ACA Medicaid expansion that Colorado implemented in January 2014. In addition to these changes in Medicaid eligibility, Colorado launched the Accountable Care Collaborative (ACC) program in 2011. The ACC program created seven Regional Care Collaborative Organizations (RCCOs) across the state to implement a new model of delivering health care to Medicaid clients. These changes, along with other innovations the Department has implemented since 2009, establish the overall context that must be considered in

[i] The other category includes children in foster care, non-MAGI aged/disabled adults and children, non-MAGI breast/cervical cancer program, non-MAGI buy-in adults and children with disabilities.

interpreting the results from our assessment of the impact of the increased payments for bump-eligible visits.

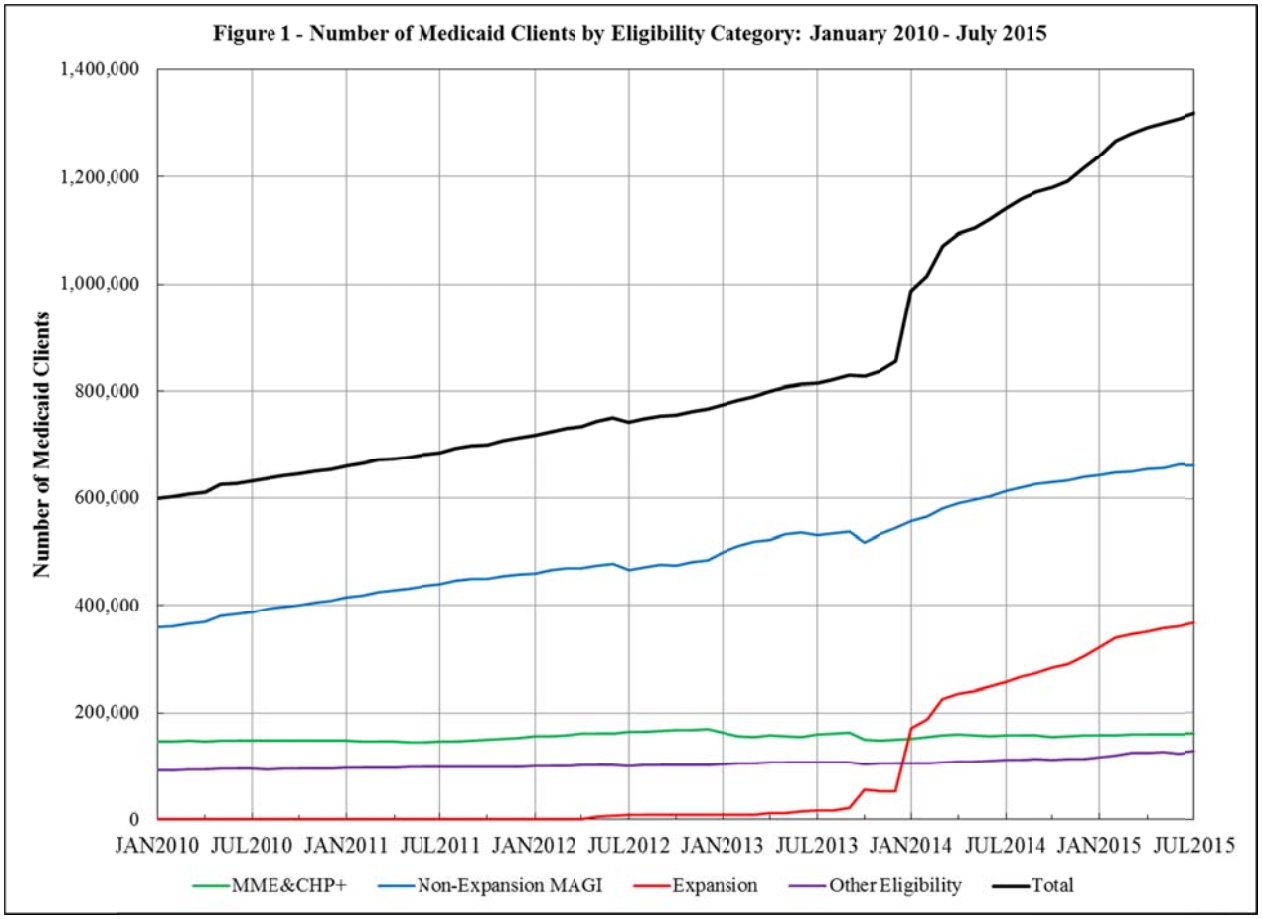
One of the most important contextual factors is the significant growth in the Medicaid client population in Colorado that started in 2008 as the recession significantly slowed economic activity in the State. Figure 1 shows the growth in Medicaid clients distinguishing among different Medicaid populations, as well as the total client population, from January 2010 through July 2015. Overall the number of Medicaid clients in Colorado more than doubled from January 2010, where there were approximately 600,000 clients, to July 2015, where there were over 1.3 million clients. As shown in this figure the number of clients that are eligible for Medicaid under the Non-expansion MAGI adults, caretaker relatives, pregnant women and children category, which includes eligibility as a result of participation in the Temporary Assistance for Needy Families (TANF)/Colorado Works program and the Baby Care program, steadily increased over this 67 month period growing from approximately 350,000 clients in January 2010 to over 650,000 by July 2015. The size of the Medicare and Medicaid eligible (MMEs) and CHP+ populations remained relatively stable over this time and the number of clients that qualify for Medicaid for other eligibility reasons has only slightly increased by approximately 30,000 from January 2010 through July 2015.[ii] This figure also shows the small and gradual initial increase in the Medicaid expansion population that resulted from Colorado's expansion under the Colorado Health Care Affordability Act and the rapid increases in this client population under the ACA's Medicaid expansion that went into effect in January 2014. By July 2015 almost 370,000 individuals were enrolled in Medicaid through these expansions in eligibility such that this population group is now the second largest category representing over 25% of Medicaid clients as of June 2015. To account for this substantial growth in the Medicaid population and the significant change in the composition of the Medicaid population over time in our analysis we have included the monthly client counts in each of the seven eligibility categories described above in our time-series and other statistical models for all of the provider-based measures.

In addition, as noted above, some of the features of Section 1202 and other ACA programs introduce additional contextual factors that should be considered in interpreting the results of our analyses. Section 1202 did not change the payment amounts for primary care under the Children's Health Insurance Program (CHP+ in Colorado) or the payment model for FQHCs, which are paid through a unique Medicaid prospective payment system. In addition, although not a feature of Section 1202, the change in payment amounts for Medicare and Medicaid eligible clients was substantially less because providers received the Medicare payment rate for the bump-eligible services already and Medicaid only paid attested providers the lower of the difference between the coinsurance and deductible. This feature resulted in a substantially smaller increase for MME clients than for other Medicaid clients. We excluded clients from all of the calculations of the measures for the months they were eligible for services as a MME or CHP+ client because we would not expect the impact of the enhanced payments to demonstrate as large an effect for these clients compared to other Medicaid clients. However, we do account for the number of MME and CHP+ clients in the statistical models for the provider-based measures. In addition, we excluded services provided by FQHCs and Rural Health Clinics (RHCs) from our provider-based measures because of the different payment models for these providers and service locations, which resulted in excluding slightly more than 20% of claims for bump-eligible services.

[ii] Figure 1 includes the Medicaid with other insurance, children in foster care, non-MAGI aged/disabled adults and children, non-MAGI breast/cervical cancer program, non-MAGI buy-in adults and children with disabilities in the other category, which combines two of the 7 categories used in the statistical models (i.e., categories 2 and 7 above).

As discussed above, the ACA also continued the enhancement of community health centers through the Community Health Center Fund to help meet the care needs of the growing number of Medicaid clients. This funding in part supported the enhancement of services provided by FQHCs and other community health centers in Colorado (e.g., extended hours, increased number of providers) that serve approximately one in every four Medicaid clients. For example, the FQHCs in Colorado served 297,426 Medicaid clients in 2014, which represents almost a 75% increase from the 171,778 Medicaid clients served in 2010.[2] This substantial increase in the services provided by FQHCs could have tempered the impact of the Section 1202 payment bump by reducing the demand for primary care services from providers that were eligible to receive the increased payments.

Taken together, these contextual factors introduce confounders in our analysis of the association between the Medicaid payment increases (both under Section 1202 and the Colorado extension) and our measures of access to care for Medicaid clients. While it is not possible to fully account for these confounding factors, our examination of multiple measures and the application of different statistical models will help in identifying any systematic relationship between the increased payments and our client-based and provider-based measures.



6. Results

This section presents the results of our graphical and time-series regression analyses of the provider-based and client-based measures, as well as the implications of our statistical models for the provider-level

monthly counts of bump-eligible visits. Overall, the findings from our graphical and time-series analyses suggest that during a time of continual growth in the Medicaid population, the client-based access to care measures remained stable and the provider-based measures indicated that the number of providers providing primary care services to Medicaid clients increased along with the number of clients. However, these findings suggested that neither the 1202 bump in payments nor the Colorado extension of the enhanced payments significantly altered the time trends in these measures in either January or July 2013 or January 2015. The findings from our statistical models suggest that the higher payments under Section 1202 coincided with an increase in the number of bump-eligible visits in a month for providers that were attested and that the Colorado extension sustained this increased number of bump-eligible visits for those providers that ever attested under the 1202 program. Taken together, these results suggest that access to primary care services for the overall Medicaid population was not negatively affected by the sustained growth and rapid addition of clients under Colorado's Medicaid expansion; however, conclusions about the specific role of the increased payments on service provision under Section 1202 of the ACA and the Colorado extension in maintaining access to care for the rapidly growing Medicaid population are tentative at this point. If the Colorado legislature does not extend the enhanced payments beyond June 2016, it is imperative this evaluation be extended to assess the extent to which primary care payment reductions impact access to care for Medicaid clients.

Provider-Based Measures

The provider-based measures assess the extent to which Section 1202 and/or the Colorado extension of the Medicaid enhanced primary care payment rates are associated with increasing the number of providers initially signing up to participate in Medicaid, increasing the number of providers delivering primary care services to Medicaid clients, and/or increasing the number of primary care visits among providers who are serving Medicaid clients. As described in Section 3, we analyzed three types of provider-based measures:

1. The number of providers who are newly active participants in the Medicaid program as measured by the number of providers in each month that are active and eligible to receive payments from Medicaid for the first time.
2. The number of providers in a month that exceed four thresholds of a specific number of bump-eligible visits in a month distinguishing between providers that ever-attested for the Section 1202 program and that never-attested by December 2014.
3. The number of bump-eligible visits in a month for each provider distinguishing months in which a provider was attested to receive the increased payment, which includes all providers beginning in January 2015.

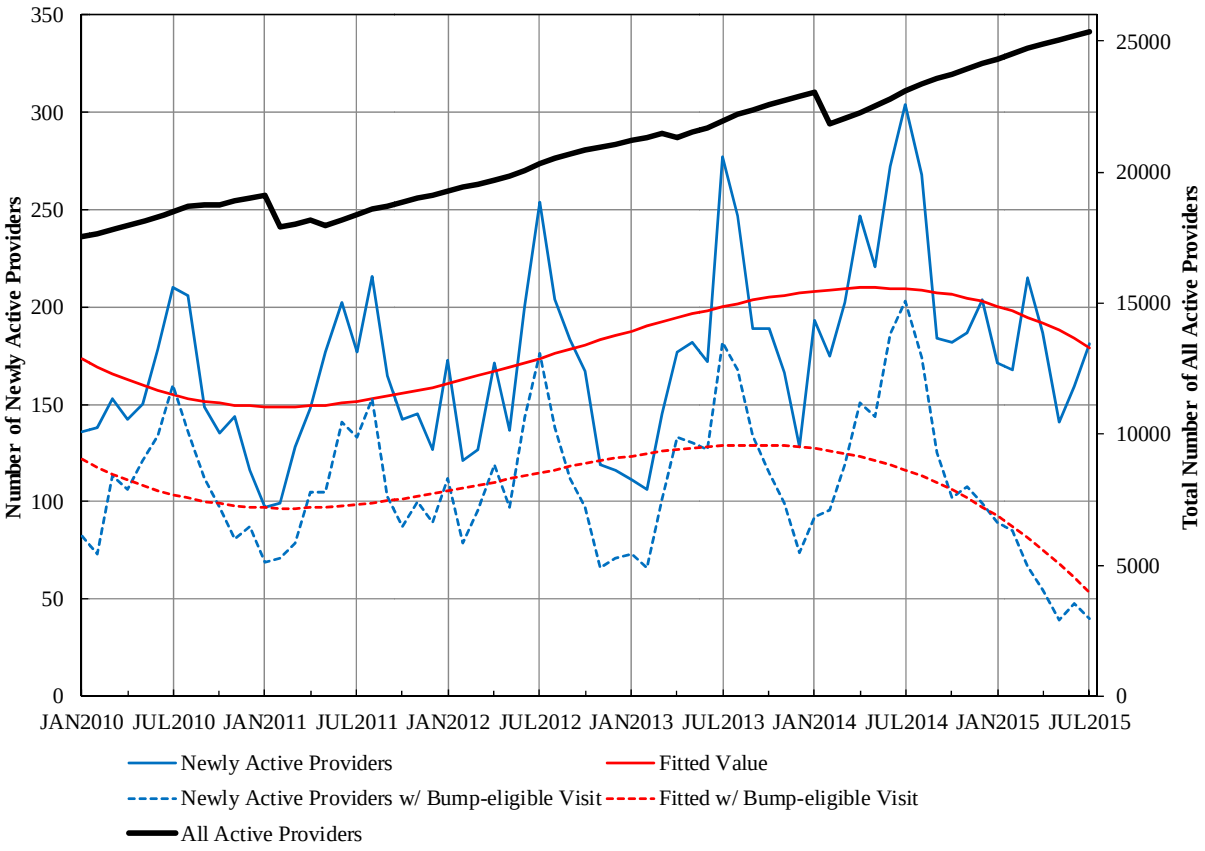
Time series regression models were used to assess the extent to which there are interruptions or discontinuities at the key time points of January 2013, when the increased payment for bump-eligible primary care services was first available (retroactively) to providers, July 2013, when the Colorado State Plan Amendment authorizing the increased payment was formally approved by the Centers for Medicare and Medicaid Services and the first payments were made to attested providers, and January 2015, when the Colorado extension became effective. Statistical models using generalized estimating equations were used to estimate the difference in the number of bump-eligible visits in a month during months providers are eligible to receive the enhanced payments, which represents the months a provider was attested between January 2013 and December 2014 and the 7 months beginning in January 2015, relative to months the providers were not eligible to receive enhanced payments for bump-eligible services.

We calculated two monthly measures of newly activated providers using the beginning date of the first episode a provider is recorded as active in the Medicaid administrative data. The first measure calculated the total number of all providers classified as a physician, non-physician provider, osteopath, and physician assistant or family/pediatric nurse practitioner that were newly active in a month from January 2010 through July 2015. This measure is not limited to primary care providers and to focus on providers

that could potentially receive enhanced primary care payments we also calculated the number of newly active providers in a month limiting the measure to providers that had at least one bump-eligible service claim after they were first active in Medicaid.

The number of newly active providers in a month along with the total number of active physicians, non-physician providers, osteopaths, and physician assistant or family/pediatric nurse practitioners are shown in Figure 2 for the period from January 2010 through July 2015. Both measures of newly active providers are presented in this figure with the solid lines representing the actual number and fitted value of the number of newly active providers and the dashed lines showing the number of newly active providers that delivered at least one bump-eligible service after starting to participate in Medicaid.

Figure 2 - Number of Newly Active Providers by Month: January 2010 - July 2015

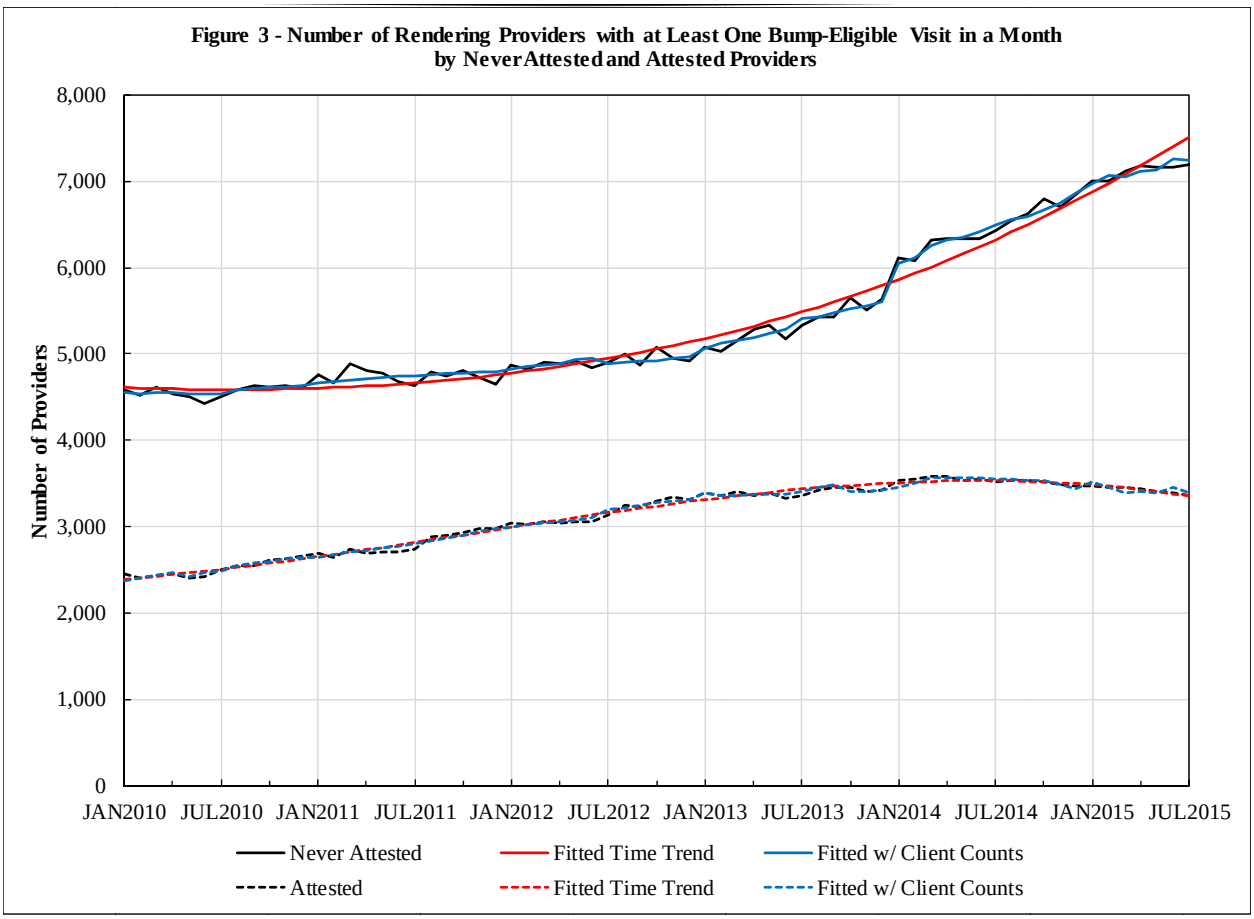


Overall, these two measures suggest that the enhanced primary care payments did not affect provider decisions to participate in Medicaid. As shown in Figure 2, there has been a gradual upward trend in both of these measures that appears to begin in 2011 that continued through 2014. This gradual upward trend did not appear to be interrupted in January or July of 2013. In addition, although there are only 12 months of information, it appears that the number of newly active providers peaked in early- to mid-2014 and declined through July 2015. However, two factors temper this inference: first, the seasonal variation appears to be moderating starting in August 2014; and second, providers that are newly active later in the period have less of an opportunity to deliver a bump-eligible service because of the shortened period of time during which they were active Medicaid providers.

For the second type of provider-based measure, we calculated measures of realized access to primary care using the four different thresholds of: (1) at least one bump-eligible visit in a month; (2) at least 6 bump-

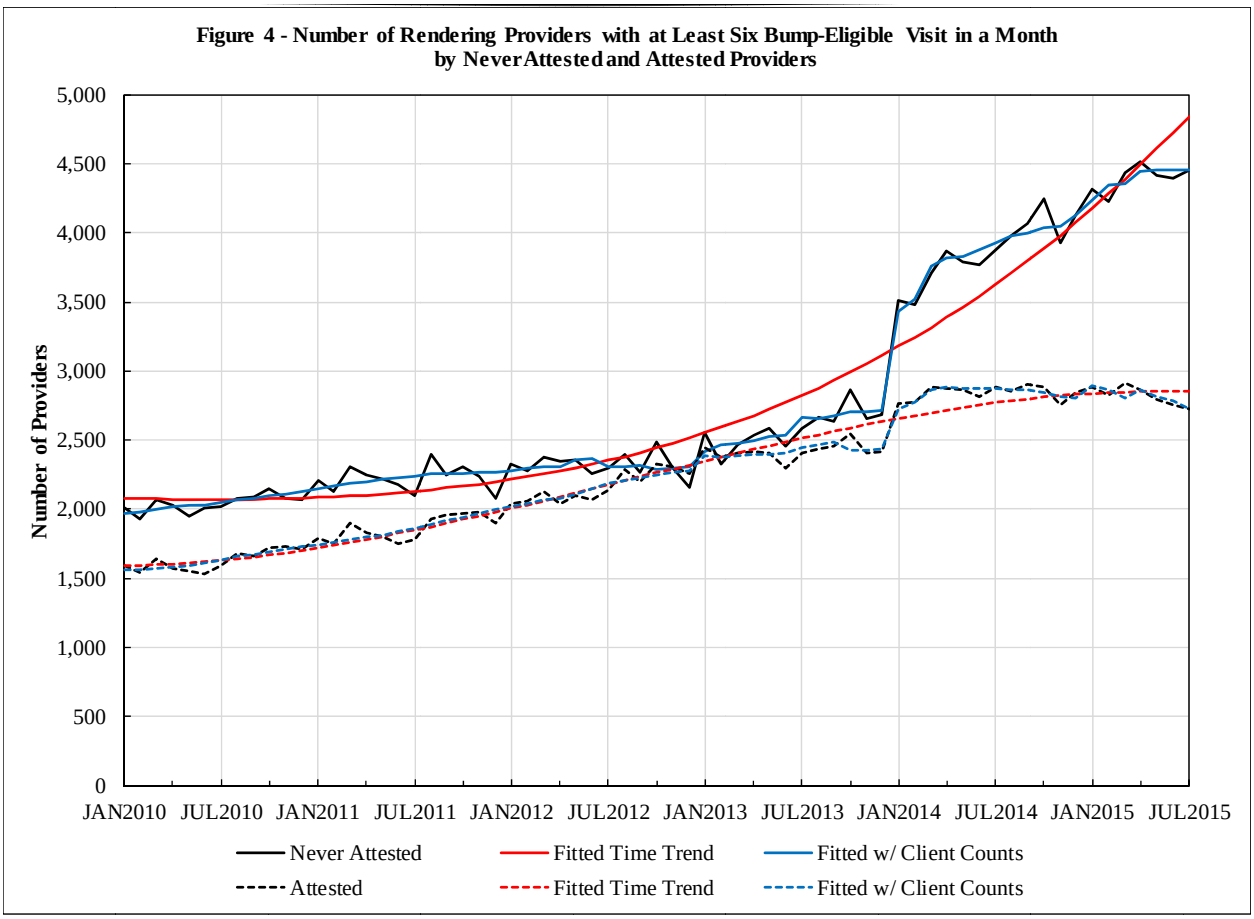
eligible visits in a month; (3) at least 16 bump-eligible visits in a month; and, (4) at least 32 bump-eligible visits in a month. We calculated these measures separately for the rendering providers that ever self-attested to receive the 1202 bump at any time before December 2014 and the rendering providers that were never attested before December 2014. These eight measures were calculated for every month from January 2010 through July 2015 resulting in a time series of 67 time points. Separate time series regression models were fitted for each of these eight measures to remove the seasonal variation in visits in each month, account for a general time trend in the measure, and control for the number of Medicaid clients in a month. These analyses were conducted on a statewide basis. The results presented in this section excluded providers delivering bump-eligible visits in Emergency Rooms; the corresponding graphs provided in the Appendix compare the time trends for these eight measures when emergency room visits are included to the results that exclude providers delivering bump-eligible visits in Emergency Room settings. The results presented in the Appendix display similar time trends to those presented in this section.

Figure 3 presents the number of rendering providers and the fitted values derived from two time series regression models of the number of providers delivering at least one bump-eligible primary care service in each month. The solid lines present the measures and fitted values for never-attested rendering providers and the dashed lines represent the measures and fitted values for rendering providers that attested before December 2014. The red lines represent the fitted values from time series models that only include seasonal adjustments and a smooth time trend, and the blue lines represent the fitted values from time series models that also include indicator variables for months after January 2013, months after July 2013, months after January 2015, and the number of Medicaid clients in a month in each of the 7 categories described above. As shown in this figure including the number of clients eligible in a month significantly improves the fit of the time series regression model.



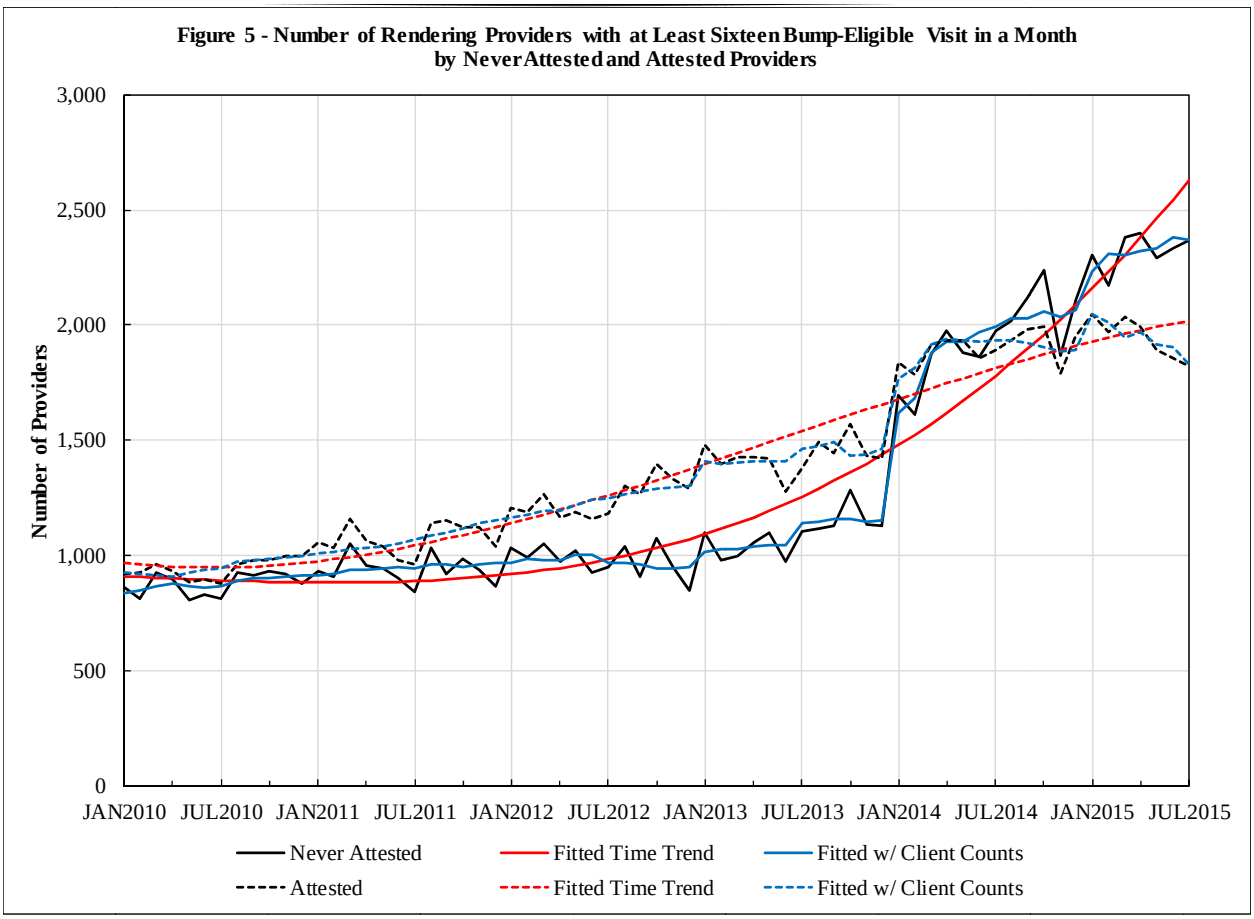
The time series plots presented in Figure 3 display similar trends for never attested and attested providers prior to January 2013, although the number of ever attested providers delivering at least one bump-eligible visit in a month increases more rapidly prior to January 2013. Around January 2013 the trends start to diverge with the number of never attested providers delivering at least one bump eligible visit in a month growing more rapidly than the number of ever attested providers. Moreover, the trend for the ever attested providers appears to begin to decline starting in July 2014 whereas the number of never attested providers continues to increase through July 2015. The results presented in this figure suggest that the Section 1202 primary care bump did not increase the number of providers delivering any bump-eligible services to Medicaid clients. These results also suggest that the Colorado extension of the enhanced payments did not influence the number of ever attested providers delivering bump-eligible services. Although the rate of increase for never attested providers slowed after January 2015, the extension may have had a small effect on never attested providers as the rate of increase was higher in the last few months of 2014 just before the Colorado extension went into effect.

Figure 4 presents the time trends for the number of rendering providers delivering at least 6 bump-eligible primary care service in each month along with the fitted values from the same two time series model specifications as described for Figure 3. As in the previous figure, the solid lines present the measures and fitted values for never-attested rendering providers and the dashed lines represent the measures and fitted value for rendering providers that attested before December 2014.



The time series plots presented in Figure 4 portray a similar pattern as displayed in Figure 3. The time trends in the number of ever attested providers delivering six or more bump-eligible visits in a month increases at a higher rate compared to never attested providers prior to January 2013 and in early 2013 there is a reversal of this rate increase. Specifically, beginning in early 2013 the rate of increase for never attested providers starts to accelerate while the rate for ever attested providers begins to slow, which is opposite of what would be expected if the Section 1202 enhanced payments were increasing the number of ever attested providers delivering 6 or more bump-eligible services in a month. Moreover, this divergence between never attested and ever attested becomes even more apparent starting in January 2014 where the never attested appear to begin delivering services to the continuing influx of expansion population clients at a higher rate compared to the number of ever attested providers, which remains fairly flat through July 2015 after an initial increase in the first few months of 2014. The rate of increase in the number of never attested providers also decreases after January 2015 suggesting that the Colorado extension of the bump in payments did not have a significant impact on the number of providers delivering bump-eligible services to Medicaid clients.

Figure 5 presents the same time trends for the number of rendering providers delivering at least 16 bump-eligible primary care visits in each month, as well as the two fitted values from the different time series model specifications. As in the previous figures, the solid lines present the measures and fitted values for never-attested rendering providers and the dashed lines represent the measures and fitted value for rendering providers that attested before December 2014.

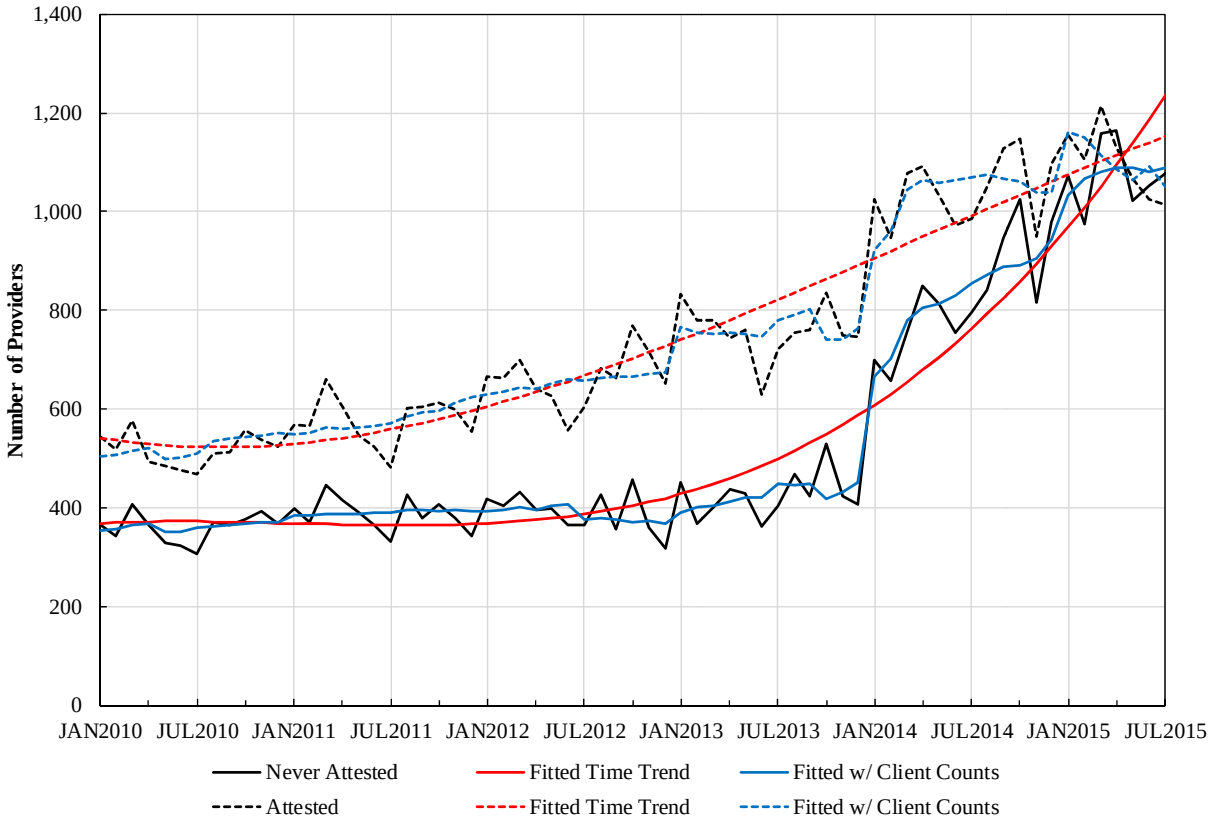


The time series plots presented in Figure 5 also demonstrates that the number of ever attested providers delivering 16 or more bump-eligible visits in a month was growing faster than the corresponding number for never attested providers prior to January 2013. This figure reveals a different pattern throughout 2013 where it appears that both the ever attested and the never attested trends are very similar in contrast to the two previous figures that showed a higher rate of increase for the never attested providers. However, as the expansion population started increasing rapidly there is a similar divergence in the patterns for never attested and attested providers delivering 16 or more bump-eligible visits in a month as was displayed in Figures 3 and 4. Specifically, the number of never attested providers delivering bump-eligible services more closely matched the increase in the number of Medicaid clients in contrast to the ever attested providers that increased at a much slower rate, such that there is a noticeable divergence in these time trends beginning in in the first half of 2014 and continuing through July 2015. The results presented in this figure also suggest that the Section 1202 primary care bump did not increase the number of providers delivering 16 or more bump-eligible services to Medicaid clients. In addition, these time trends suggest that the Colorado extension of the enhanced payments did not impact the number of ever attested providers delivering 16 or more bump-eligible services in a month and a potential small effect on providers who never attested under the Section 1202 program immediately prior to January 2015 and possibly in the first months of 2015.

Figure 6 presents the time trends for the number of rendering providers delivering at least 32 bump-eligible primary care service in each month and the fitted values from the two time series model specifications for this measure. As in the previous figures, the solid lines present the measures and fitted values for never-attested rendering providers and the dashed lines represent the measures and fitted value

for rendering providers that attested before December 2014. Similar to the previous three figures, the inclusion of the number of Medicaid clients in a month improves the fit of these time series models.

Figure 6 - Number of Rendering Providers with at Least Thirty-two Bump-Eligible Visit in a Month by Never Attested and Attested Providers



The time series plots presented in Figure 6 reinforce the patterns that were displayed in Figure 3 through 5 and further highlight the divergence in the time trends between ever attested and never attested providers starting in January 2014. The number of ever attested providers delivering 32 or more bump-eligible services in a month is increasing at a faster rate from January 2011 through January 2013 compared to never attested providers over this same time period. Moreover, similar to the patterns in Figure 5, the rates of increase from January 2013 through December 2013 are very similar for the ever attested and never attested rending providers; however, the number of providers in both categories are not growing as quickly for the providers delivering 32 or more bump-eligible visits in a month compared to the other three threshold values. Figure 6 also displays an evident divergence in the trends for ever attested and never attested rendering providers starting in January 2014, which corresponds to the rapid increase in the number of Medicaid expansion clients. Specifically, the number of never-attested providers delivering more the 32 bump-eligible visits in a month starts increasing rapidly and continues to increase at a high rate through January 2015; whereas, the number of ever-attested providers delivering 32 or more bump-eligible services increases at a high rate in the first few months of 2014 and then remains relatively flat for the rest of 2014. Both time trends show an initial increase around January 2015 at the time the Colorado extension went into effect but this increase noticeably ends after the first two months of 2015, suggesting there may have been a small temporary effect of the extension.

Taken together the time series plots presented in Figures 3 through 6 suggest that neither the Section 1202 primary care payment bump nor the Colorado extension of enhanced payments for bump-eligible services significantly increased either the number of providers serving Medicaid client or the number of bump-eligible visits delivered by providers in a month. The results in these figures do not show any substantial increase in the number of ever-attested providers delivering bump-eligible primary care services around January or July 2013 relative to providers that never attested to receive the increased payments under Section 1202. The divergence in the time trends for the never attested compared to the ever attested providers in and after 2013 is consistent across all four threshold values, suggesting that the increased payments did not increase the number of bump-eligible primary care encounters either when the payments were first available in January 2013 or when the Colorado State Plan Amendment was approved and the initial lump-sum payments were made around July 2013. In addition, the time trends for both the never attested and ever attested providers around January 2015 suggest that the Colorado extension of the enhanced payments may have had a temporary effect but did not substantially increase Medicaid clients' realized access to primary care services. Further, these results suggest that as the number of Medicaid clients increased providers were able to increase the delivery of primary care services to meet the increased level of demand.

One limitation of the four threshold time series models is that it includes in the attested group all providers that ever attested to receive Section 1202 enhanced payments, including providers before they completed their attestation and were eligible to receive the increased payments. Providers attested at different times throughout the two year period and the timing of attestation is not taken into account in these threshold models. To help isolate the effect of the increased payments for providers in months that they are attested and eligible to receive the additional reimbursement, we estimated multiple statistical models with the number of bump-eligible visits in a month for rendering providers that had at least one bump-eligible encounter from January 2010 through July 2015 using generalized estimating equation methods. These provider-level models of monthly counts of bump-eligible visits accounted for seasonality, general time trends, the number of Medicaid clients in each of the seven eligibility categories, whether the provider is an established or new Medicaid provider in the month, if the provider ever attested under the Section 1202 program, and whether the provider is attested in a specific month. The inclusion of other potentially confounding factors helps to isolate the potential impact of the payment policy changes on the number of providers delivering primary care services to Medicaid clients and on the number of bump-eligible primary care visits. In addition, these same models were used to identify increases in the number of bump-eligible visits in a month after January 2015 once all providers became eligible to receive the enhanced payments under the Colorado extension, regardless of a provider's self-attestation action.

As described in Section 4, we estimated both linear and Poisson count models relating the number of bump-eligible visits in a month to whether the provider was eligible to receive an enhanced payment, which equates to a provider being attested in the month from January 2013 through December 2014 and all providers from January through July 2015. To assess the sensitivity of the findings to the specific statistical model, we estimated a linear regression and instrumental variables model for all providers and all months (which included months with zero counts); and both a linear regression and Poisson count model using two-stage methods. In the two-stage models, first the probability that a provider has one or more bump-eligible visits in a month is estimated and then the second stage only includes months for providers that had one or more bump-eligible visit in that month. These two-stage models are widely used and for the Poisson count models are referred to as Zero-Inflated Poisson count models. Secondarily, to account for the potential that providers who were ever attested and attested in a specific month are in some way systematically different from never attested providers, we applied instrumental variable methods in the linear count models. All of the generalized estimating equation models accounted for

providers contributing multiple observations by allowing correlation in unobservable factors across time for individual providers.

For each of the models, with the exception of the instrumental variables model, we estimated two specifications: constrained and unconstrained. The first specification constrained the effects of seasonality, general time trends, the number of Medicaid clients in each of the seven eligibility categories, and whether the provider is an established or new Medicaid provider in the month to be the same across never attested and ever attested providers. The second specification is unconstrained and allowed the effects of these potential confounders to differ between never attested and ever attested providers.

The parameter estimates from the different models are not directly comparable and to translate the implications of these models into a common framework we have calculated the additional number of bump-eligible visit a "typical" attested provider delivered in a month the provider was attested compared to months in which the provider was not attested to receive the enhanced payment under the Section 1202 program. Table 1 presents the estimated number of additional monthly bump-eligible visits for the different models and the two specifications. In all of these models the parameter estimates associated with a provider being attested in a month are highly statistically significant.

Table 1 – Estimated Number of Additional Bump-Eligible Visits in a Month a Provider is Attested

Model	Specification	
	Constrained	Unconstrained
Linear Regression Model with Zero Visit Months	4.5 visits	3.5 visits
Two-Stage Linear Regression Model	3.5 visits	2.4 visits
Zero-Inflated Poisson Count Model	3.2 visits	6.1 visits
Instrumental Variables Linear Model with Zero Visit Months	2.5 visits	

The results presented in Table 1 suggest that providers delivered approximately 2 to 6 additional bump-eligible visits in months they are attested to receive increased payments under the Section 1202 program compared to the number of visits that would be expected without the additional payments. For an average attested provider this represents approximately a 10% increase in the number of bump-eligible visits in a month. The average number of additional visits across these seven model specifications is 3.7 additional visits and the median is 3.5 additional visits per month.

The estimated number of additional visits in months when providers were attested can be combined with the number of attested providers in a month to estimate the total number of additional bump-eligible visits in a month. As the number of attested providers in a month varied from 3,571 in January 2013 to 4,321 in December 2014, at the average number of additional visits this translates into approximately 13,000 additional bump-eligible visits in January 2013 that increases steadily to almost 16,000 per month by December 2014.

Although not shown in Table 1, the results from all seven of these statistical models suggest that the Colorado extension to the enhanced primary care payments did not increase the number of bump-eligible visits for providers that had not previously attested under the Section 1202 program. Specifically, all of the parameter estimates associated with the period from January through July 2015 were negative for the never attested providers indicating a reduction in the number bump-eligible visits after the Colorado extension went into effect. Some of these estimates were not statistically significant and the results indicated that the reduction was less than one visit per month. The parameter estimates for the ever attested providers associated with the time period the Colorado extension was in effect varied across these model specifications with a central tendency suggesting that the number of visits for these providers did not change during the expansion period. In interpreting the findings regarding the Colorado extension it is important to recognize that we only have data for the first seven months the extension was in effect and

additional data for the remaining 11 months of the currently authorized extension could alter these inferences. Furthermore, if the extension is not re-authorized it will be critical to evaluate whether the approximately 30% reduction in average payments for bump-eligible services reduces the number of providers delivering these services to Medicaid clients and/or reduces the number of visits among providers that continue to serve Medicaid clients.

Client-based Measures

The results from the provider-based measures suggest that both never attested and attested providers increased their provision of primary care services to Medicaid clients as the number of clients increased over the period from January 2010 through July 2015. However, although unclear, these results suggest that the enhanced payments for bump-eligible services under Section 1202 and the Colorado extension only had a minor, if any, impact on the provision of these services. While the primary mechanism of action of the enhanced payments is through influencing provider behavior, the ultimate policy goal is to ensure that the expanding Medicaid population has access to primary care services. To assess the extent to which these trends in provider delivery of bump-eligible services translated into access to primary care services for Medicaid clients, we examined four client-based access to care measures. As described in Section 3, these measures are: (1) the AHRQ PQI #92 composite measure of the number of emergency department visits for ACSC relative to the size of the Medicaid population; (2) the HEDIS AAP measure; (3) the HEDIS CAP measure; and, (4) the UPC measure to assess continuity of care for adult Medicaid clients.

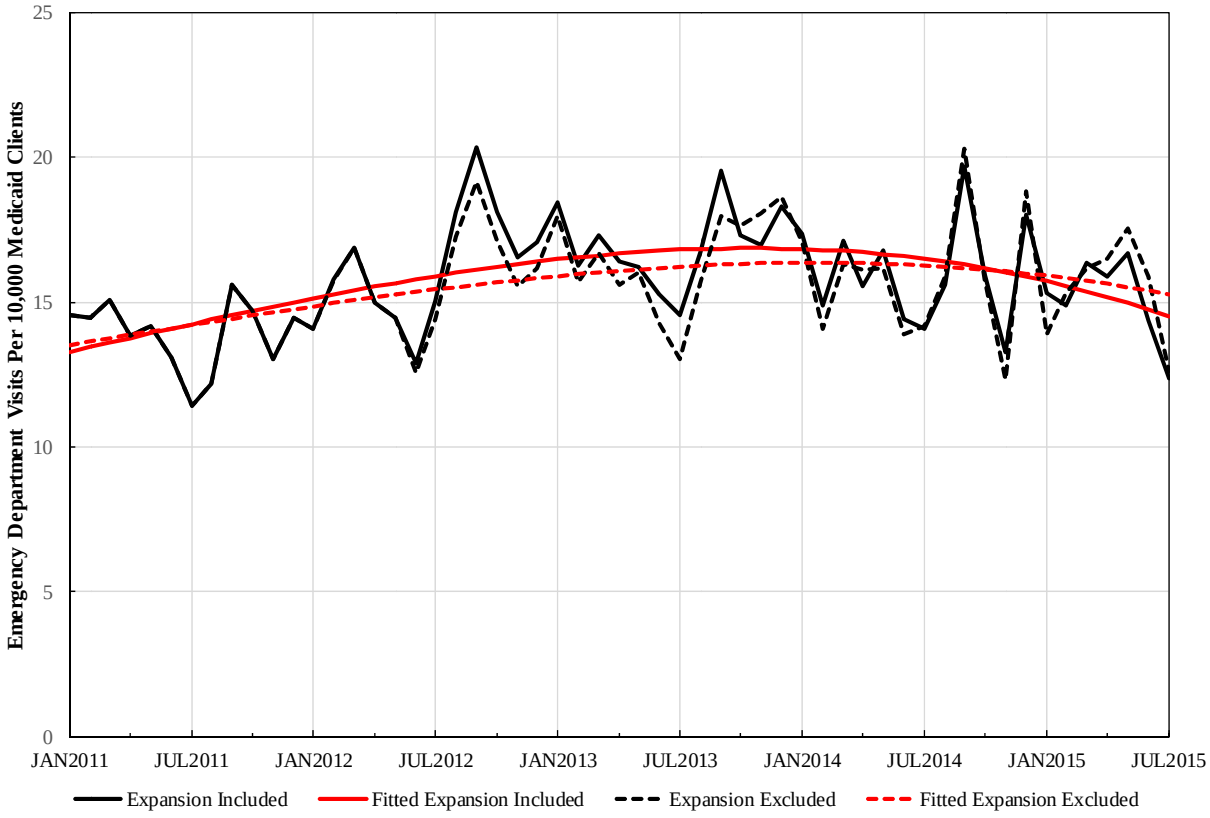
The AHRQ PQI #92 composite measure of emergency department visits for ACSC is expressed as the number of emergency department visits per 10,000 members of a population, which in this case is the population of Medicaid clients aged 18 years and older excluding MME and CHP+ clients. A higher number for the PQI #92 composite measures is viewed as an indicator of potential, actual, or perceived barriers to access to primary care and other community-based outpatient services for the Medicaid client population. As described above, we calculated a slightly modified composite PQI #92 measure on a monthly basis from January 2011 through July 2015 resulting in a time series of 55 observations. We calculated the modified version for four Medicaid client populations that included and then excluded the expansion population, because the expansion population may be very different from other Medicaid population segments, then calculating the measures with and without limiting the population to clients that were enrolled in Medicaid 11 of the previous 12 months.

The results for the adult Medicaid client population (excluding MME and CHP+) including and excluding the expansion population are presented in Figure 7. The corresponding measures that limit the population to clients who were enrolled in 11 of the previous 12 months, although not shown in the figure, display very similar patterns; however, on average this population experiences 1 to 2 more ACSC emergency department visits per month per 10,000 clients compared to the average for all clients. Figure 7 presents both the actual measure and the fitted value of the measure that highlights the underlying time trends in the measures that include and exclude the expansion population. The solid lines represent the actual and fitted values of the measures for the population including the expansion population and the dashed lines represent the values excluding the expansion population.

A positive impact of the Section 1202 payment increase would result in a decrease in this access to care measure as fewer emergency department visits for ACSC indicates better access to primary care and community-based services. The results presented in Figure 7 indicate that there were not any significant changes in this measure of access to care for Medicaid clients associated with the timing of the Section 1202 increase in payment rates in either January or July 2013, as the rate continues its slight upward trajectory until late 2013. However, there is a leveling off of the rate and potentially a slight downward trend starting in early 2014 and continuing through July 2015. Although the timing of this improvement

coincides with the influx of the expansion population, the same time trends showing improvement in this measure is still evident when the expansion population is excluded from the measure.

Figure 7 - Number of Emergency Department Visits for Ambulatory Care Sensitive Conditions Per 10,000 Adult Medicaid Clients with and without Expansion Clients

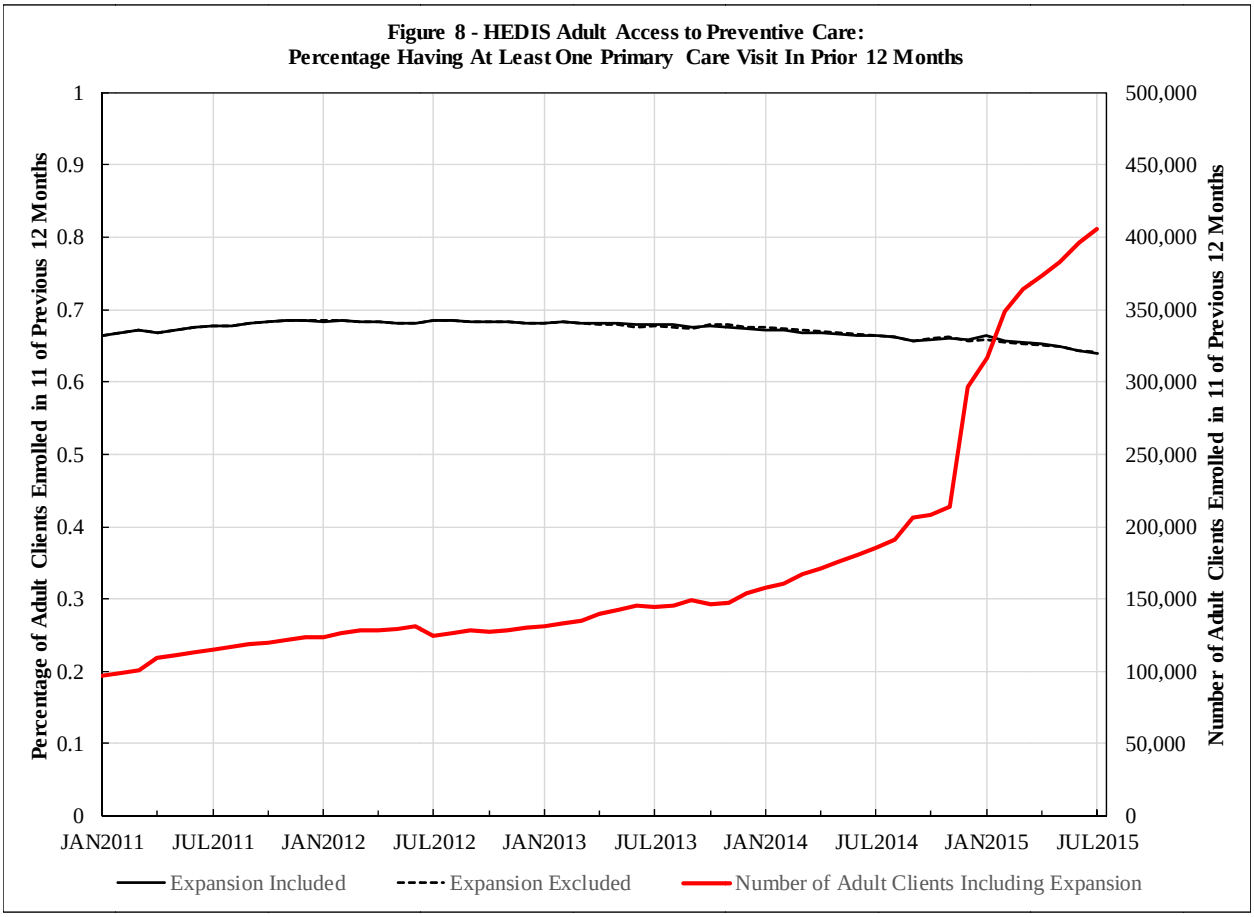


It is unreasonable to expect that emergency department visits for ACSC would change significantly at a single point in time as a result of a policy change. Several recent studies indicate that a relatively stable percentage of Medicaid clients will continue to use the emergency department for ACSC regardless of appointment availability in primary care raising questions about the sensitivity of this measure to changes in access to care for Medicaid clients.[19] The potential reversal of the upward trend in this measure in late 2013 suggests that Medicaid clients in Colorado are likely to have better access to quality primary care around this time; however, as described in Section 4 the multitude of changes in the Colorado Medicaid program makes it very difficult to attribute this to the Section 1202 bump as opposed to other policy and program changes, such as the expansion of the ACCs and activities of the RCCOs.

The most common types of claims-based realized access to care measures focus on the use of preventive care services by clients and the two HEDIS access to care measures are widely used by both private and public insurance plans to monitor beneficiary access to primary care. We calculated the Adult Access to Preventive Care (AAP) measure and the Children and Adolescents' Access to Primary Care Practitioners (CAP) measure to examine realized access to care for adult and pediatric populations. As described in Section 3, we calculated these measures by applying the HEDIS specifications with some minor modifications. The HEDIS specifications limit the population measured to clients that were eligible for Medicaid in 11 of the previous 12 months. This definition of the population included in the measure along

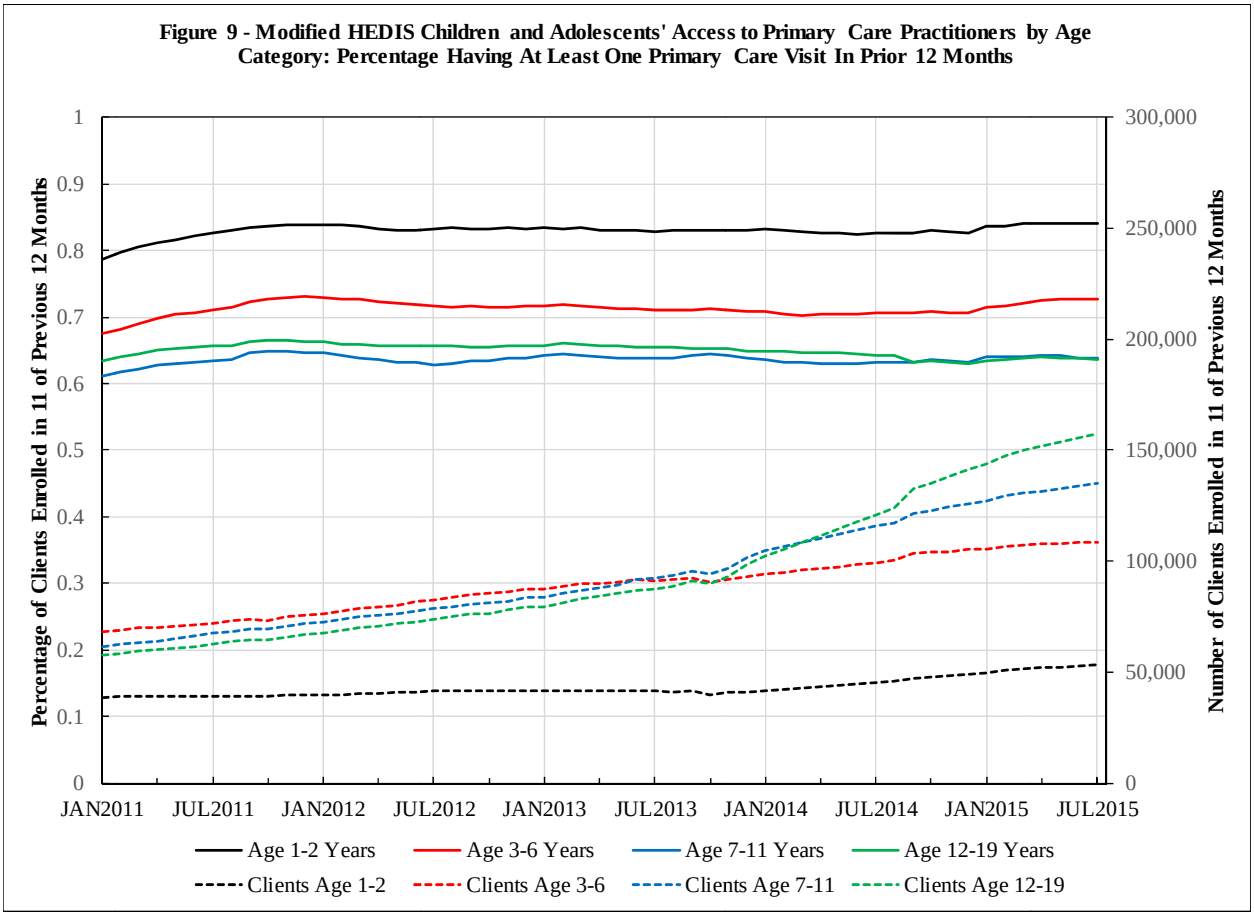
with the 12-month look back period for a primary care visit results in a smooth time series for this measure and, as such, we did not fit a time series regression model for these two measures.

Figure 8 reports the AAP measure monthly starting with January 2011 through July 2015 for adult (aged 20 years and older) Medicaid clients excluding MME clients. Similar to the AHRQ PQI #92 measure, we calculated the AAP measure including the expansion population (solid line) and excluding the expansion population (dashed line). This figure also shows the number of adult clients who were Medicaid eligible for 11 of the previous 12 months, including the expansion population, with the number of clients displayed on the secondary axis (right hand side) of the figure.



The results presented in Figure 8 suggest that the AAP measures of realized access to care for adult Medicaid clients has remained stable showing that between 65 and 70% of the adults that were eligible for Medicaid in 11 of the previous 12 months have had a primary care visit in the last 12 months. These results also show that this access to care measure is not sensitive to the inclusion or exclusion of the expansion population as the measures are virtually identical when this population is included and excluded from the calculation. This figure provides evidence that during this time of rapidly increasing numbers of Medicaid clients their realized access to primary care services was maintained at previous rates at least for adult clients that were eligible for Medicaid in 11 of the previous 12 months. This suggests that there was capacity in the Colorado primary care system to serve the growing adult Medicaid population, although it is unclear whether this is independent of or the result of the increase in payments for bump-eligible services.

Figure 9 presents the CAP measure monthly starting with January 2011 through July 2015 for four age ranges: (1) 12 to 24 months; (2) 25 months to 6 years; (3) 7 to 11 years; and (4) 12 to 19 years (excluding CHP+ clients). This figure also shows the number of clients in each age range that were Medicaid-eligible for 11 of the previous 12 months including the expansion population, which represents a very small number of clients in these age ranges. In this figure the solid lines represent the CAP measures for each age range and the dashed lines represent the number of clients in each age range, which is shown on the secondary axis (right hand side) of the figure.

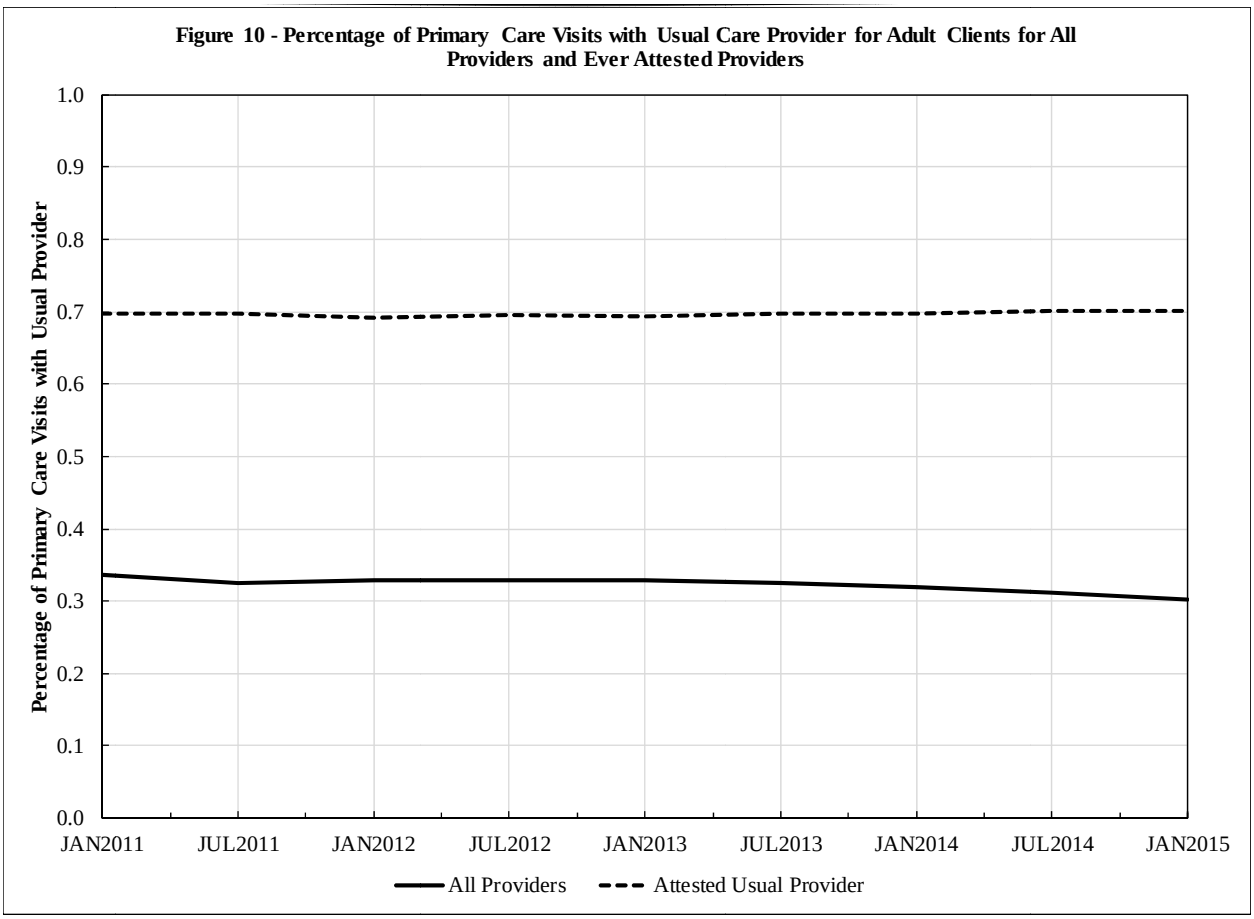


The results presented in Figure 9 provide additional evidence that the Colorado primary care providers accommodated the rapidly increasing Medicaid population and maintained the same level of realized access to care throughout this period of growth. Specifically, while it does not appear that the increased payments for bump-eligible primary care services improved realized access to care on these HEDIS measure between January 2013 and July 2015, it is equally important to note that for all four age groups there was no significant deterioration in access even for the age groups with the highest growth in population over this time period. Again, we would not expect a measure based on the population that is eligible for Medicaid in 11 of the previous 12 months to change in any noticeable way at specific time points, such as January and July of 2013 or January 2015; however, there does appear to be a slight increase in all four age range CAP measures in January 2015. This common improvement at the time of the Colorado extension suggests there may have been a small impact of the expanded availability of the enhanced payments on access to care for pediatric populations. It will be important to monitor this measure to see if it continues to improve over a longer period of time.

Improved access to primary care services may also increase the continuity of primary and preventative care services. A final client-based measure we examined to assess whether the increased payments for primary care services affected access to care was the modified Usual Provider Continuity Index (UPC) that calculates the percentage of primary care services rendered by a client's "usual provider of care" within a time period. We calculated this measure only for adults defining the usual provider of care as the provider with the most number of encounters in the specified time period using the rendering provider identifier and modifying the standard UPC definition to focus on HEDIS AAP visits. Specifically, we calculated the number of these encounters with the usual provider divided by the total number of these encounters in the time period. We calculated separate measures of the UPC for rendering providers that ever attested to receive the increased payments for bump-eligible services by December 2014 (dashed lines) and for all rendering providers that includes ever attested and never attested providers (solid lines). As noted in Section 3, in contrast with the other client-based measures that were calculated on a monthly basis, this measure was calculated on a semi-annual basis beginning with the first six months of calendar year 2010 (January – June) through the first six months (January – June) of 2015. In addition, as there is not a standard approach to account for clients who do not have any relevant visits, we calculated these measures only for clients with at least one eligible visit in the six month period.

Figure 10 presents both versions of this measure for adults aged 20 years and older. The solid lines in the figure presents the findings for clients regardless of whether their usual provider was never attested or ever attested at some time before December 2014 and the dashed lines in the figure presents the findings for clients with a usual rendering provider in the relevant 6-month time interval that ever attested. Although there are only 9 values for this measure, we analyzed the time series properties to identify potential trend lines and potential changes in January and July 2013, and January 2015. While this measure covers a six-month period, we label the measure with the first month of the period.

The results presented in Figure 10 suggest that clients with a usual provider of care that self-attests to receive the increased payments have a significantly higher continuity of care compared to clients with a never-attested usual provider of care. The absence of any noticeable trends in these continuity of care measures suggests that these measures for adult clients are not affected by the increased payments for bump-eligible primary care services, and that the existing levels of care continuity were maintained over this period of rapidly increasing numbers of Medicaid clients.



7. Conclusion

The analyses presented in this report examined multiple access to care measures for both provider-based measures and client-based measures to assess the extent to which the increased payments for bump-eligible services affected access to these primary care services for Medicaid clients. Overall, the results suggest that the increased payments did not significantly affect these realized access to care measures for Medicaid populations when providers became eligible to receive the increased payments for delivering the specified primary care services to Medicaid clients.

Our analysis of the three provider-based measures did not reveal any significant impact of the enhanced primary care payments under either Section 1202 or the Colorado extension on the number of providers applying to deliver services under the Medicaid program or the number providing bump-eligible services to Medicaid clients. While these aggregate measures of provider participation in Medicaid and delivery of bump-eligible services suggested that the increased payment did not impact realized access to care, our provider-level analysis of the number of bump-eligible visits in a month suggested a small increase ranging from 2 to 6 additional visits in months the providers were eligible to receive the enhanced payments under Section 1202. In addition, although based only on the first seven months of the Colorado extension of the payment bump, the results suggested that the extension did not impact the provider-based realized access to care measures.

Our analysis of the client-based access to care measures did not reveal significant changes in any of these realized access to care measures in January or July of 2013, which corresponds to the beginning of the period where the increased payments were first available (January 2013) and the approval of the Colorado State Plan by CMS that included the payment bump as well as the first payments issued to providers that had self-attested before July 2013. There did appear to be a change in the rates of emergency department visits for ambulatory care sensitive conditions in early 2014 independent of whether this measure included or excluded the expansion population. The improvement in this client-based access to care measure continued through July 2015, suggesting that access to primary care services for Medicaid clients is improving in Colorado; however, it is not clear if this improvement is due to the enhanced payments for primary care services or the cumulative effect of all of the innovations in the Colorado Medicaid program over the last five years. There is also a hint of an improvement in the child and adolescent HEDIS CAP measure for all age categories we measured starting in January 2015, which corresponds to the start of the Colorado extension. Additional analysis should be conducted to assess the extent to which this is a sustained improvement or a temporary increase in these realized access to care measures. It is important to also highlight that all of the client-based access to care measures remained stable even in the face of rapid growth in the Medicaid population, suggesting that the Colorado primary care system was able to accommodate this growth without reductions in historical levels of realized access to care prior to the Medicaid expansion.

The lack of any convincing evidence of a marked impact of the Section 1202 and Colorado extension of the enhanced payments for primary care services on the client-based access to care measures raises the question of whether these measures would reasonably be expected to change in the time frame that the increased payments were in effect. The payment bump was designed to influence provider decisions regarding their participation in Medicaid and the number of available appointments scheduled for Medicaid clients. Without accompanying policy changes that are designed to influence care seeking behavior of Medicaid clients it is not clear we should expect client-based access to care measures to change as a result of changes in provider payments. The one client-based measure that we might expect to be affected by changes in primary care provider payments over a limited time period is the emergency department visits for ACSC and the time trends for this measure are showing improvement starting in 2014. However, whether this improvement is related to Section 1202 and the Colorado extension of the payment bump or other innovations in the Colorado Medicaid program, such as the ACC and RCCO initiatives, is difficult if not impossible to disentangle.

Finally, combining results from the provider-based and client-based analyses clearly reveals that the primary care system in Colorado provided services to the State's rapidly increasing Medicaid client population while maintaining historical levels of access to primary care services. The time trends in the provider-based measures are closely associated with the trends in the number of Medicaid clients both in terms of the number of providers delivering any bump-eligible services as well as the number of bump-eligible visits delivered in a month. The evidence suggests that as the potential demand for these services increased the primary care system delivered services in response to this increasing demand. However, the provider-based measures suggest that the enhanced payments under Section 1202 did not significantly impact the Colorado primary care system's response to this increasing demand. The interrupted time series analysis suggests that providers who did not self-attest to receive the enhanced payments for bump-eligible services responded more to the increased demand compared to providers that attested to receive the enhanced payments. This does not necessarily imply that the enhanced payments did not contribute to this response, as the provider-level analysis indicates that attested providers increased the number of bump-eligible services they delivered, on average, by 2 to 6 visits per month when they were attested to receive higher payments. In addition, because the most rapid growth in the Medicaid client population occurred in early 2014 and the rate of increase has fallen back to what can be considered historical norms, assessing the impact of the Colorado extension of the enhanced payments with only seven months of data

is preliminary at best. With this significant caveat, the preliminary results suggest the extension of the enhanced payments is resulting in attested providers maintaining the 2 to 6 additional bump-eligible visits in a month and not significantly influencing the delivery of bump-eligible services for never attested providers.

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Appendix 1 Provider-Based Measures Including Emergency Room Visits

This Appendix presents the findings from our analyses that included bump-eligible visits provided in Emergency Rooms by rendering providers from January 2010 through July 2015. The measures presented in this appendix provides comparable figures to Figures 3, 4, 5 and 6, and are provided here as Figures 3a, 4a, 5a, and 6a. In addition, the implications of our seven statistical models of provider-level measures of the number of bump-eligible visits delivered in a month that includes Emergency Room visits is presented in Table 1a. A comparison of the time trends in the corresponding figures suggests similar time trends for both ever attested and never attested providers; however, there is a noticeable decrease in the number of never attested providers and only a small decrease in the number of ever attested providers exceeding each threshold when emergency room visits are excluded. The findings presented in Table 1a are also very similar to the findings that excluded Emergency Room bump-eligible visits. The findings including emergency room visits also suggest that attested providers increased the number of bump-eligible visits in a month by 2 to 5 visits per month after the provider attested to receive the increased Section 1202 payment. In addition, the results from the models including emergency room visits also did not indicate that provider behavior was affected by the Colorado extension of the bump payments in January 2015, which included enhanced payments for emergency room visits. As stated in the report, this is preliminary evidence only as there are only 7 months of data available after the Colorado extension went into effect.

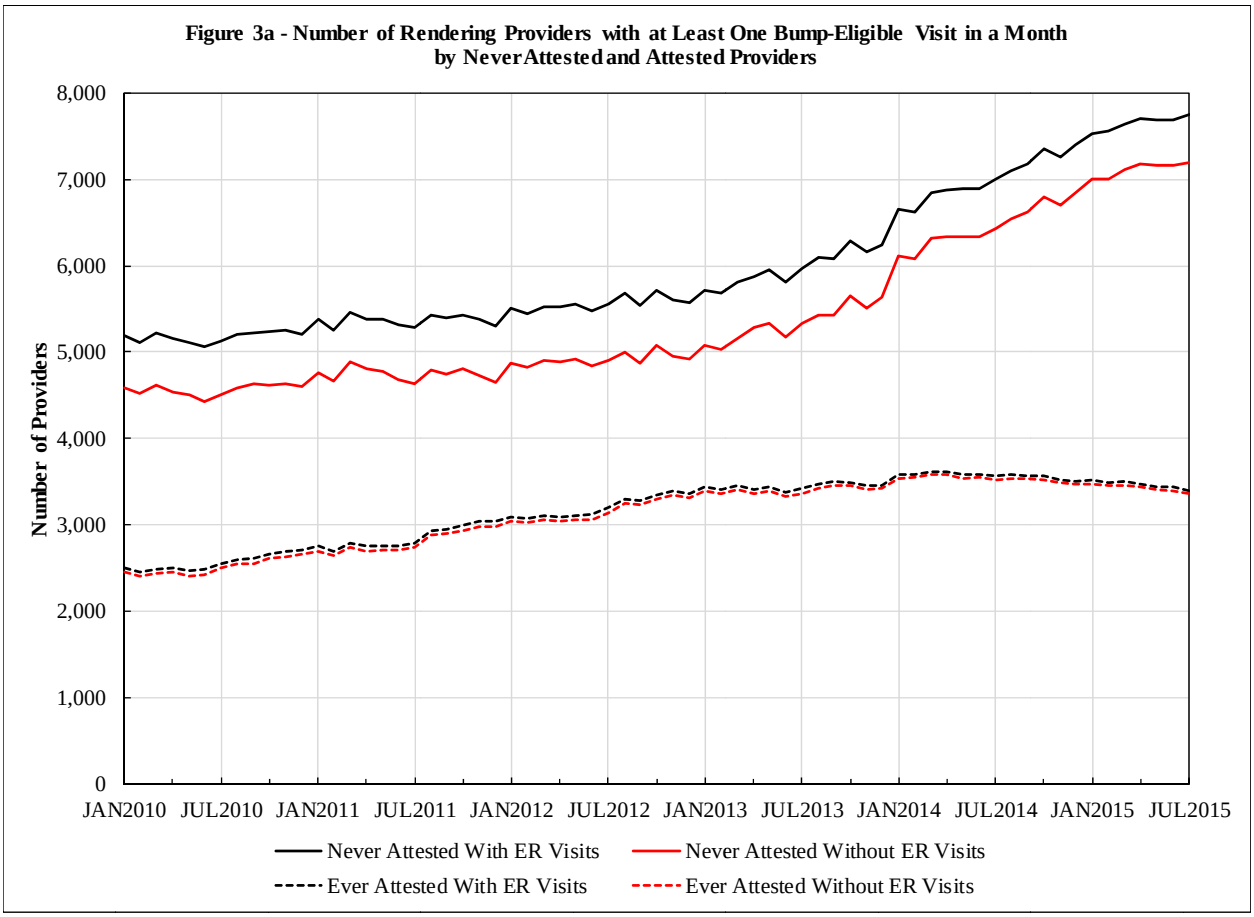


Figure 4a - Number of Rendering Providers with at Least Six Bump-Eligible Visit in a Month by Never Attested and Attested Providers

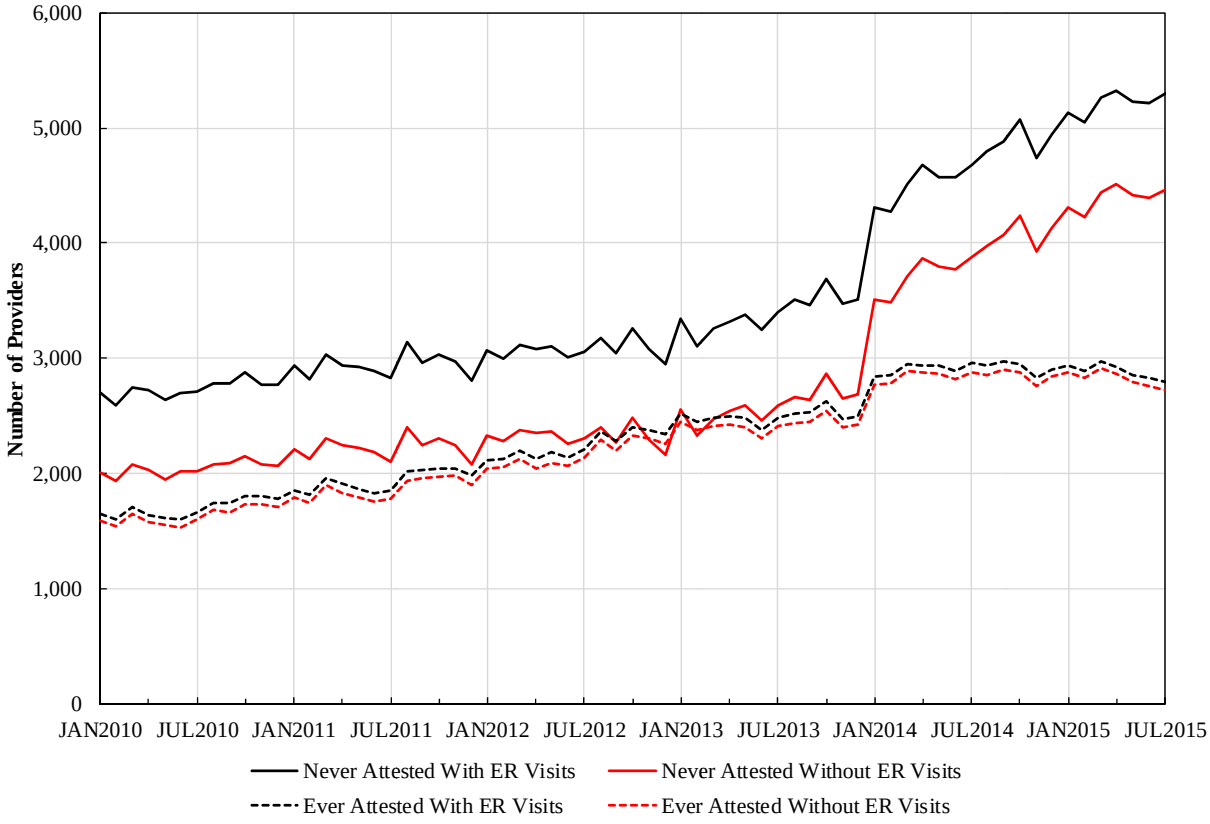
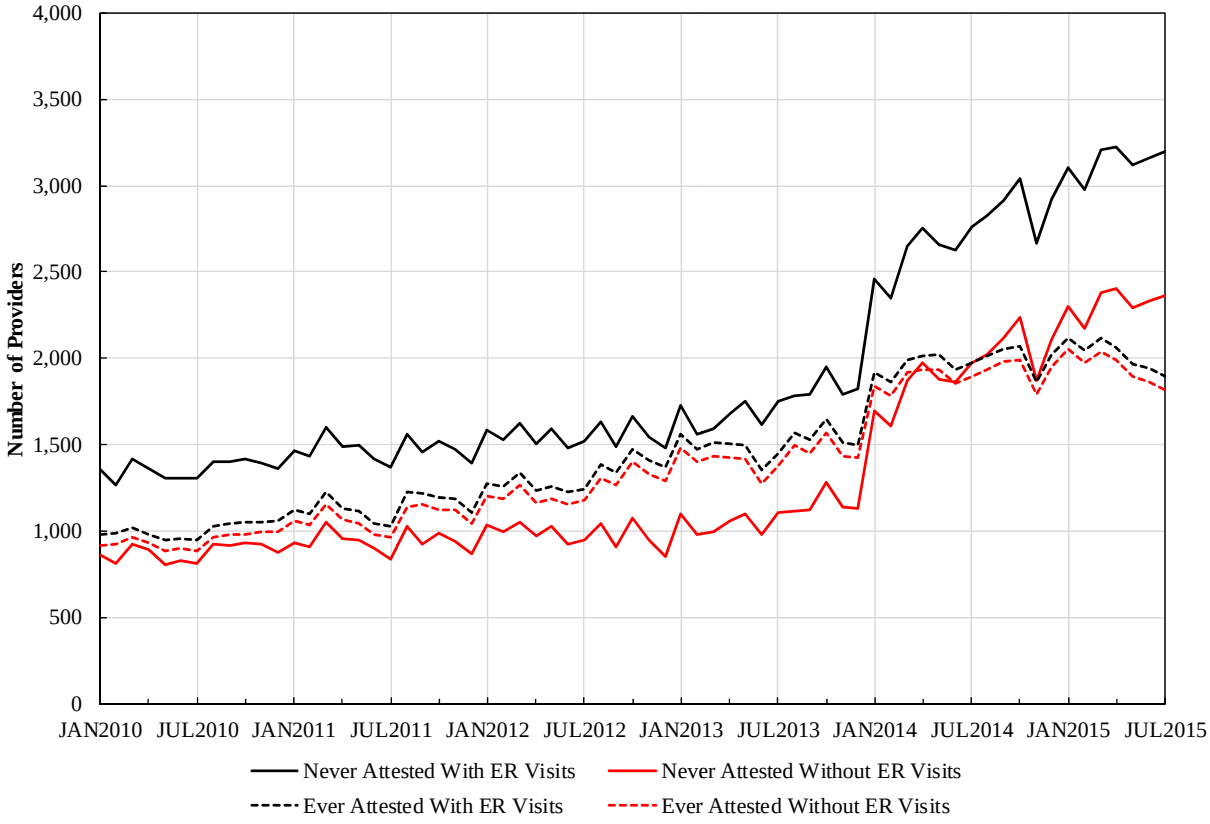


Figure 5a - Number of Rendering Providers with at Least Sixteen Bump-Eligible Visit in a Month by Never Attested and Attested Providers



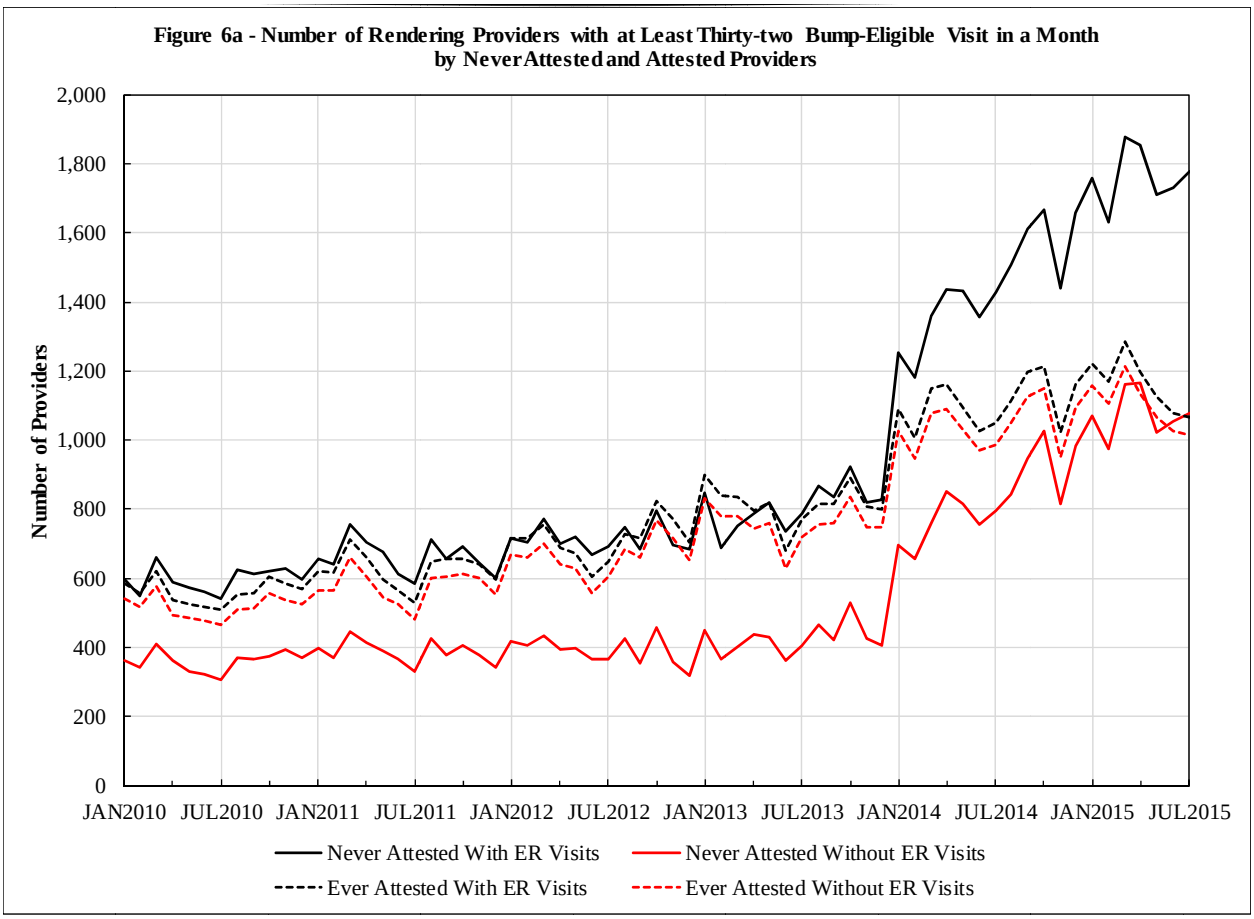


Table 1a – Estimated Number of Additional Bump-Eligible Visits in a Month a Provider is Attested

Model	Specification	
	Constrained	Unconstrained
Linear Regression Model with Zero Visit Months	3.9 visits	3.4 visits
Two-Stage Linear Regression Model	2.2 visits	2.1 visits
Zero-Inflated Poisson Count Model	1.9 visits	5.5 visits
Instrumental Variables Linear Model with Zero Visit Months	3.8 visits	

Appendix 2: Colorado Continuation of Enhanced Rates for Selected Primary Care Services

The Colorado General Assembly has approved a second extension of the primary care rate bump allowing the Department to continue paying an enhanced rate for a more limited set of primary care services. In 2014, following the expiration of the ACA Section 1202 provisions to reimburse primary care providers (PCPs) delivering a broad range of primary care services to Medicaid clients at Medicare rates, the Colorado General Assembly approved the continuation and expansion of the enhanced rates from January 2015 through June 2016. The expiration of this extension of the Section 1202 payment increase in June 2016 potentially would reduce payments to the primary care system in Colorado by more than $100 million a year. Balancing budgetary pressures with this potential reduction in payments to the primary care system, the General Assembly extended an enhanced rate for a more limited set of primary care services for State Fiscal Year (SFY) 2016-17. This funding authorization was part of the Long Bill package, HB16-1408, Cash Fund Allocations For Health-related Programs and the rate enhancements will be effective July 1, 2016 through June 30, 2017 pending federal approval.

The SFY 2016-17 rate enhancements is funded through the Primary Care Provider Sustainability Fund. This fund is created in the state treasury from money transferred from the Children's Basic Health Plan Trust and any other appropriated or transferred money authorized by the general assembly. The Department may expend these funds for the purpose of increasing access to primary care through rate enhancements for targeted primary care services. The continuation of the enhanced payments covers a more restrictive set of primary care services compared to the original Section 1202 payment bump and the Colorado extension of Section 1202 through June 2016. The continuation of enhanced rates is limited to six service groups that includes primary care office visits, preventive medicine visits (health screening services), counseling and health risk assessments, immunization administration, and newborn care including neonatal critical care services provided by PCPs.

Table 1 summarizes the six service groups and the corresponding Current Procedure Terminology® (CPT) codes comprising each category. All of the services covered by the six categories included in the continuation of enhanced payments were included in the bump-eligible services that were covered under Section 1202 and the first extension of enhanced payments in Colorado from January 2015 through June 2016.

To assess the potential impact of the continuation of enhanced payment rates for these services, it is essential to establish a baseline set of measures to assess the extent to which this policy achieves its goals. This appendix provides these baseline measurements for the six categories as a group and as individual groups of services. These baseline measures are presented in the context of the findings related to the assessment of the enhanced payments under Section 1202 and the first extension of the payment bump in Colorado because these services were included in the bump-eligible serviced under these initiatives. Specifically, this appendix presents the results an analysis of these six categories of services over 67 months (January 2010—July 2015) examining similar provider-based and client-based measures of realize access to care for these services as were used in the analyses of the Section 1202 and Colorado extension.

Appendix 2 Table 1: Primary Care Services included in Continuation of Enhanced Payments

Service	**CPT Code**
Primary care office visit*	99201-99205 new patient evaluation and management (E&M) services 99211-99215 established patient E&M services
Preventive medicine visits (health screening services)**	99381 new patient under 1 year 99382 new patient (ages 1-4 years) 99383 new patient (ages 5-11 years) 99384 new patient (ages 12-17 years) 99385 new patient (ages 18-39 years) 99391 established patient under 1 year 99392 established patient (ages 1-4 years) 99393 established patient (ages 5-11 years) 99394 established patient (ages 12-17 years) 99395 established patient (ages 18-39 years)
Counseling and health risk assessment ***	99401-99414, 99417-99429 99401 duration 15 min 99402 duration 30 min 99403 duration 45 mins 99404 duration 60 min 99406 & 99407 smoking & tobacco use counseling (3-10 min) & (>10 min) 99408 & 999409 substance use & abuse counseling (15-30 min) & (>30 min)
Immunization Administration	90460 <19 years administered with counseling, 1st vaccine 90461 + each additional vaccine/toxoid component 90471 immunization administration, one vaccine 90472 + each additional vaccine 90473 immunization by intranasal or oral, one vaccine 90474 + each additional vaccine intranasal or oral

Service	CPT Code
Newborn Care#	99460-99465 normal newborn care (E&M) within first 28 days after birth and prior to discharge home 99460 initial hospital/birthing center care E&M 99461 subsequent hospital/birthing center care E&M 99463 initial hospital/birthing center care E&M same day discharge 99464 attendance at delivery 99465 delivery/birthing room resuscitation 99477-99486 99477-99480 initial and continuing intensive care services 99478 <1500 grams 99479 1500-2500 grams 99480 2501-5000 grams 99485 & 99486 supervision by a physician of inter-facility transport care <24 months
Critical care visits-newborn and pediatrics##	99466-99476 99466 critical care services during inter-facility transport 99467 each additional 30 minutes 99468 initial inpatient pediatric critical care E&M 0 - 28 days old 99469 subsequent inpatient pediatric critical care 0 - 28 days old 99471 initial inpatient pediatric critical care E&M 29 days-24 months 99472 subsequent inpatient pediatric critical care 29 days-24 months 99475 initial inpatient pediatric critical care 2-5 years 99476 subsequent inpatient pediatric critical care 2-5 years

*http://www.aafp.org/fpm/2003/0900/p33.html
**http://www.dhcs.ca.gov/services/Documents/CMS-416-instructions.pdf
***http://www.aafp.org/fpm/2012/0700/p12.html
#http://www.aappublications.org/content/33/12/30
#http://www.aafp.org/practice-management/payment/coding/newborn.html
##https://www.aapc.com/blog/24267-pediatric-critical-care-codes-moved-for-easier-coding/

Provider-Based Measures

To provide a baseline for a future assessment of the impact of the continuation of enhanced payments for selected primary care services under the Primary Care Provider Sustainability Fund, we calculated the number of visits in a month in each of the six service categories for active Medicaid providers in each month beginning in January 2010 through July 2015. In addition, as a comparison to the provider-based measures in the analysis of the bump-eligible services, we also calculated the number of visits in a month for any of the six service categories for active Medicaid providers in each month. To maintain comparability with the findings for bump-eligible services, we excluded visits where a rendering provider was not identified in the claim and visits in Emergency Room settings.

One provider-based baseline measure calculated the number of providers with one or more visit in a month for each of the six service categories and for any of these services. A second baseline measure calculated the number of providers with six or more visits in a month but only for the most common service category of primary care office visit and any of the continuation services combined. Again, to provide comparability with the analyses of bump-eligible services, separate measures were calculated for providers that were ever self-attested and approved to receive the increased payments before December 2014 under the Section 1202 bump and providers that never self-attested.

Client-based Measures

The continuation of the enhanced payments for specific services may affect Medicaid clients' access to quality primary care as measured by the realized client-based access to care measures used to assess the impact of the Section 1202 bump and the Colorado extension through June 2016. These measures are based on widely-accepted definitions that use individual CPT codes and provide general measures of access to primary care services. To provide an additional set of baseline client-based measures that focus on the specific services that are included in Appendix 2 Table 1, we calculated a set of client-based utilization measures for each of the six service categories. Specifically, we calculated the percentage of Medicaid clients that are eligible in a month with one or more visits in a month with a claim for the CPT codes included in each service category.

It is important to note that these monthly utilization measures are fundamentally different from the client-based access to care measures used in the report to assess the impact of bump-eligible services under Section 1202 and the Colorado extension. These general access to care measures incorporate a look back period of multiple months to identify clients' receipt of the selected primary care services in calculating the measures for each month. In contrast, the monthly utilization measures we are calculating only look back over a single month for receipt of a service and, as such, will be substantially lower than the access to care measures that most often include look back periods of 12 months. Moreover, the monthly utilization measures will also display more variation due to seasonal factors compared to the measures that include a longer look back period. It is critical to recognize these two features of monthly utilization measures in interpreting the findings for the client-based measures reported below.

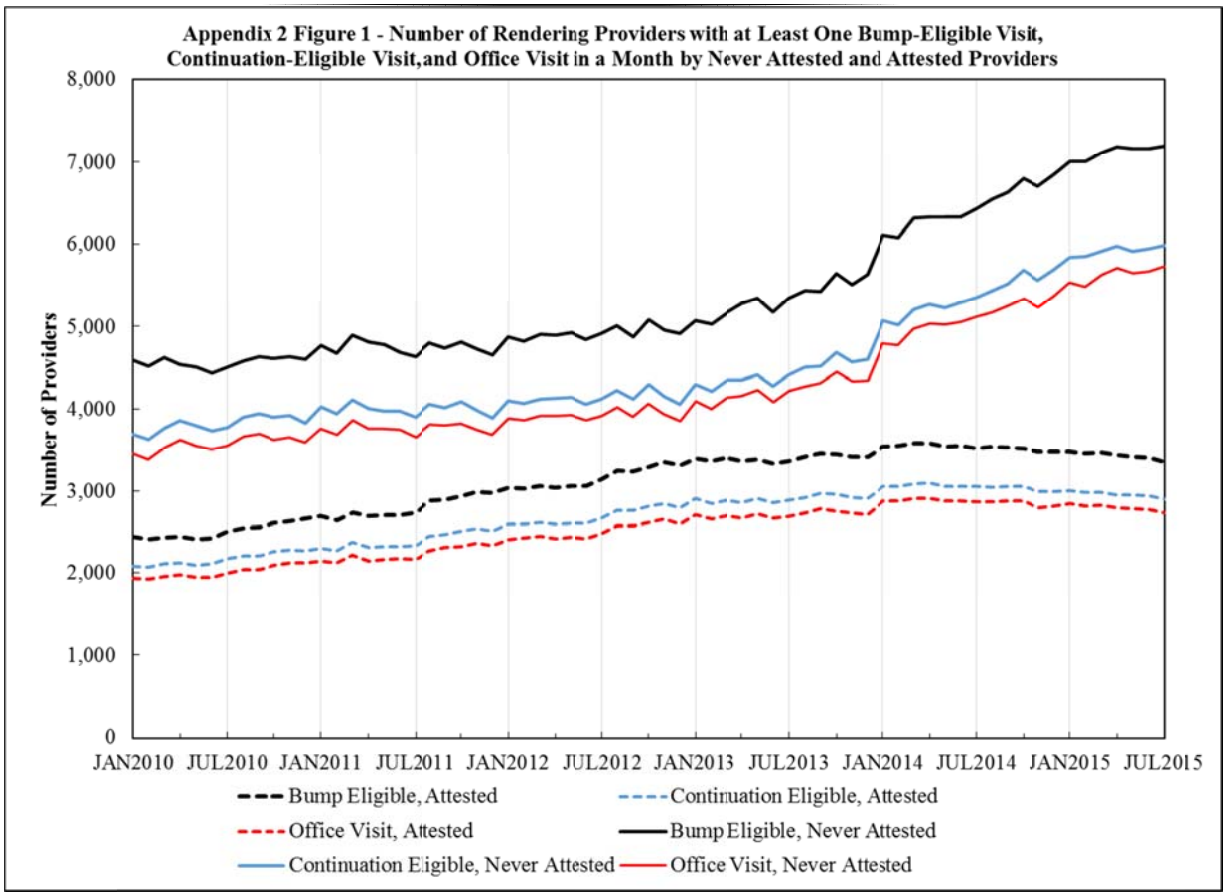
As some of the six service categories included in the Colorado continuation of enhancement payments for primary care services only apply to clients in specific age ranges, we calculate the monthly utilization measures dividing eligible Medicaid clients into seven age groups based on age at the beginning of a month. Specifically, the seven age groups are 0-11 months, 12-23 months, 24 months-6 years, 7-11 years, 12-18 years, 19-39 years, and 40-64 years. Utilization of newborn visits and critical care visits for newborns and pediatric clients are only reported for clients in the 0-11 month age group. Similarly, because counseling and health risk assessments are infrequently provided to young children, utilization of this service category is only reported for clients 12 years of age or older (i.e., age groups 12-18, 19-39, and 40-64). Utilization measures for office visits, preventative medicine visits and immunization administration are reported for all age groups.

Results

Similar to the approach used to assess the impact of the Section 1202 bump and the Colorado extension of the 1202 enhanced payments, we used graphical methods to analyze the provider-based and client-based baseline measures of the six service categories included in the Primary Care Provider Sustainability Fund. For comparison purposes we also present the monthly number of providers with at least one bump-eligible visit and with six or more bump-eligible visits. For the client-based measures we calculated, by age group, the percent of enrolled Medicaid clients in a month with at least one continuation-eligible visit in each service category.

Appendix 2 Figure 1 presents the number of rendering providers delivering at least one bump-eligible visit during a month (shown in black), the number of rendering providers delivering one or more visits in any of the six continuation service categories (shown in red), and the number of rendering providers delivering at least one office visit with the continuation codes specified in Appendix 2 Table 1 (shown in blue). The solid lines present the findings for rendering providers that never attested to receive enhanced payments under Section 1202 and the dashed lines present the number of rendering providers that self-attested before December 2014.

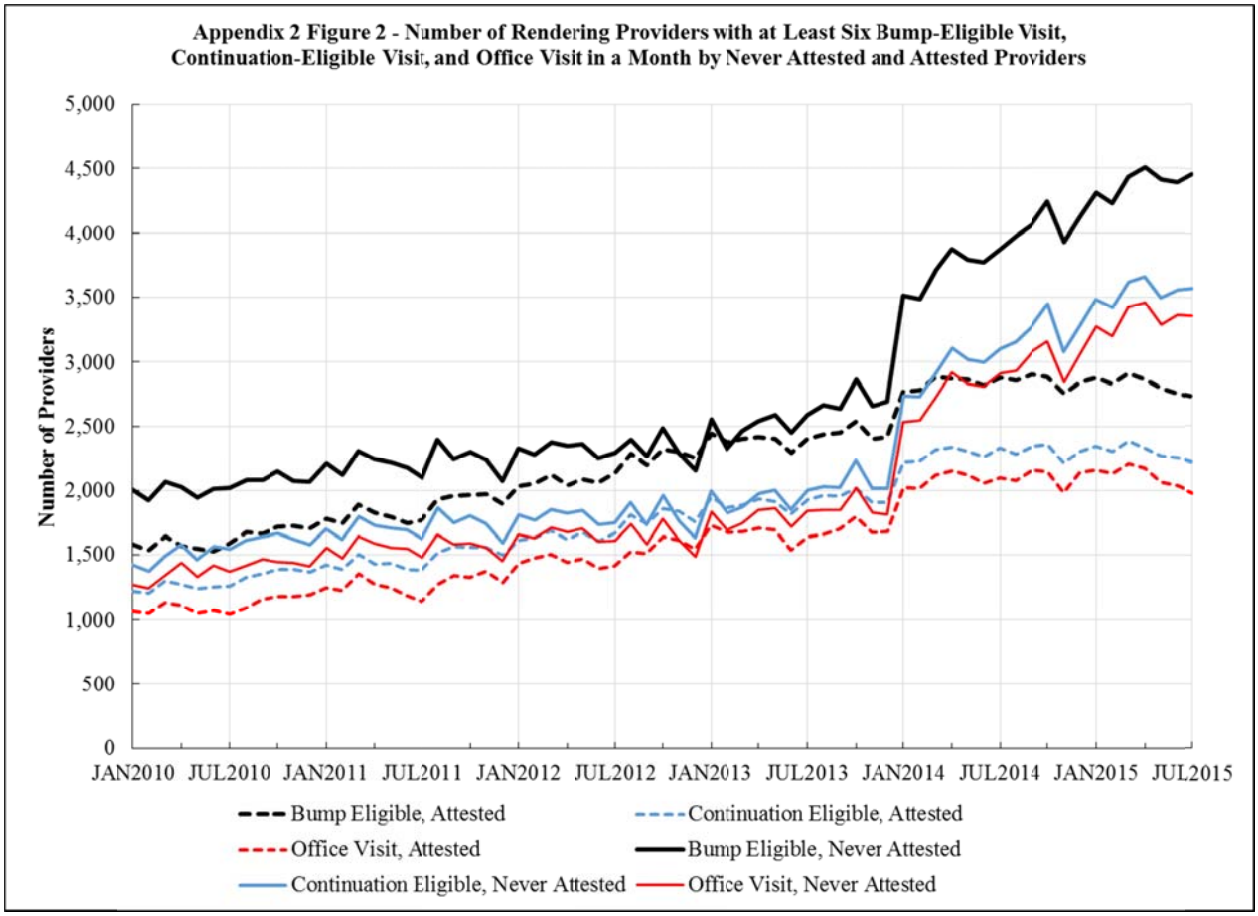
The findings presented in Appendix 2 Figure 1 suggest that the time series properties for any continuation-eligible visit and office visits essentially parallel the time series properties for the number of providers with at least one bump-eligible visit. The time series plots demonstrates that overall there were a higher number of never attested providers delivering one or more continuation-eligible service in a month and a higher number of providers delivering at least one primary care office visit. The time trends for all three types of services show a relatively modest increase in the number of never attested providers from January 2010 through early 2013 and a marked increase in January 2014 with a higher rate of increase following the Medicaid expansion in January 2014 and the continued rapid growth of the number of Medicaid clients in Colorado. Although the time trends for the self-attested providers display a similar modest, although slightly higher rate of increase from January 2010 through early 2013, there is a divergence in 2013 that continues through July 2015 between the trends for attested and never attested. Specifically, beginning in early 2013 the number of attested providers with at least one visit in a month is essentially stops increasing and apart from a jump in January 2014 at the time of the expansion it remains flat to even a slight decrease through July 2015. In contrast, the number of never-attested providers with at least one visit in a month continues to increase at a higher rate from January 2014 through July 2015.



Appendix 2 Figure 2 presents the number of rendering providers delivering six or more bump-eligible visits during a month (shown in black), the number of rendering providers delivering six or more visits in any of the six continuation service categories (shown in red), and the number of rendering providers delivering six or more office visits (shown in blue). The solid lines present the findings for rendering providers that never attested to receive enhanced payments under Section 1202 and the dashed lines present the number of rendering providers that self-attested before December 2014.

The time series plots presented in Appendix 2 Figure 2 display a very similar pattern to the time trends for attested and never attested providers in Appendix 2 Figure 1, although with more month to month variation. A notable difference between Appendix 2 Figure 1, which required the rendering provider have at least one bump-eligible visit, and Appendix 2 Figure 2, which required the rendering provider have at least six bump-eligible visits, is the smaller difference between the number of never attested and attested providers in January 2010. This smaller difference in the number of providers provides a clearer picture of the time trends. Specifically, the higher rate of growth in the number of attested providers from January 2010 to January 2013 is more apparent in this figure as around January 2013 there are essentially the same numbers of attested and never attested providers delivering six or more visits in each of the three service categories (bump eligible, continuation eligible, and office visits). The change in growth rates in January 2013 is also more noticeable in this figure as the number of never attested providers delivering office visits more so than any continuation-eligible continues to increase throughout 2013 whereas the number of attested providers remains essentially constant as the Section 1202 bump begins to take effect. The divergence between in the growth rates of the number of never attested and attested providers delivering six or more visits in a month becomes even more apparent after January 2014 when the number

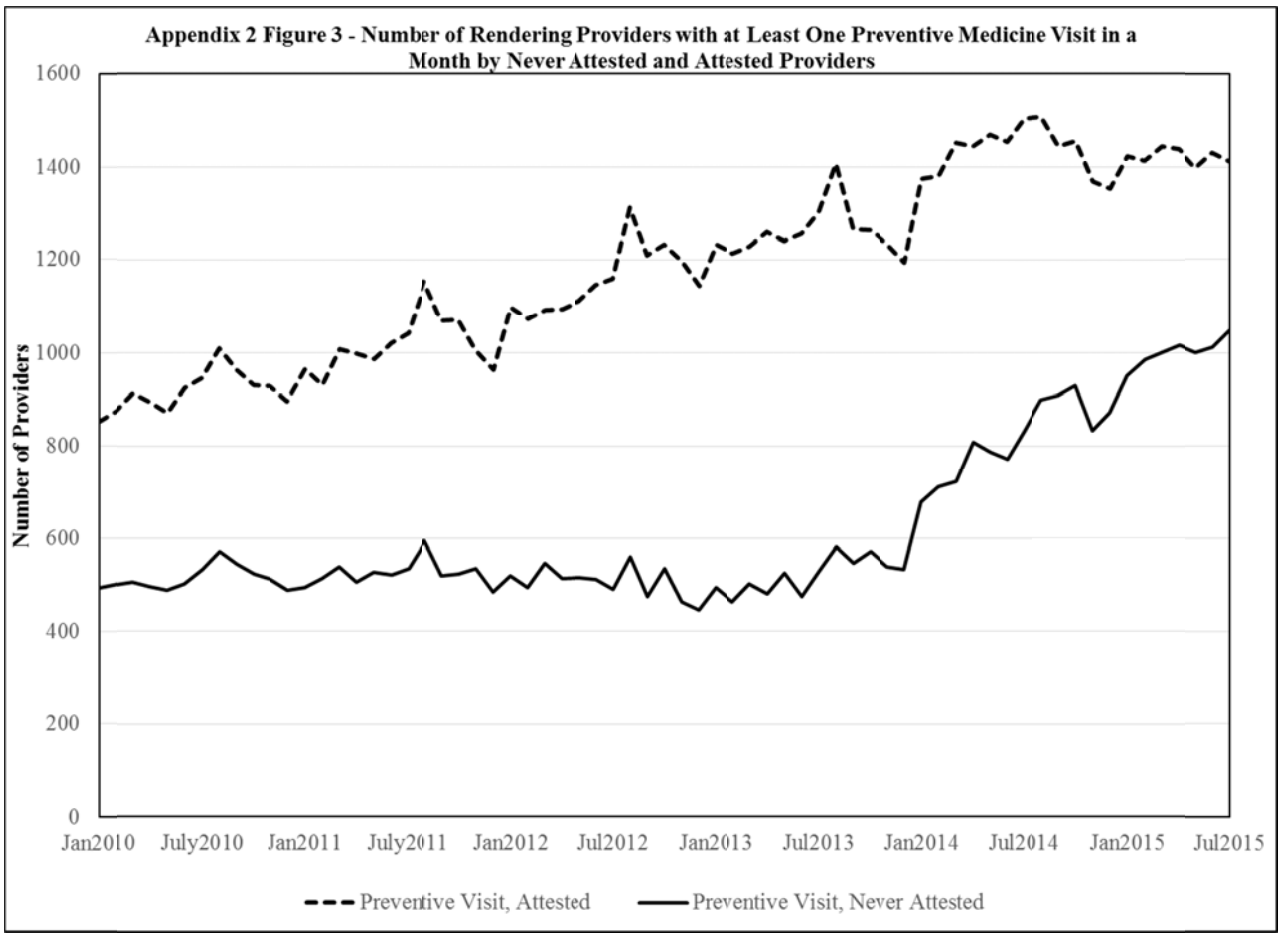
of never attested providers increases sharply and continues to increase at a rapid rate compared to the more modest increase in January 2014 and the relatively constant number of attested providers through July 2015.



Appendix 2 Figures 3 through Appendix 2 Figure 6 present the time trends in the number of active rendering Medicaid providers delivering at least one visit in a month for each of the other five individual service categories (preventive care, counseling and health risk assessment, immunization administration, newborn, and pediatric critical care), again distinguishing between never attested and attested providers. The threshold of one visit in a month is used for these individual service categories because of the relative infrequent utilization of these services by Medicaid clients and the small number of providers delivering these specific services in a month. Even with this minimal threshold there is considerable month to month variation in the number of providers delivering one or more visits. These figures present the raw counts of providers and do not control for seasonal factors, number of Medicaid clients, or other factors that can influence the number of providers delivering the service in a month. As in the previous figures, the solid lines present the measures for never attested rendering providers and the dashed lines represent the measures for the rendering providers that attested before December 2014 for the Section 1202 payment bump.

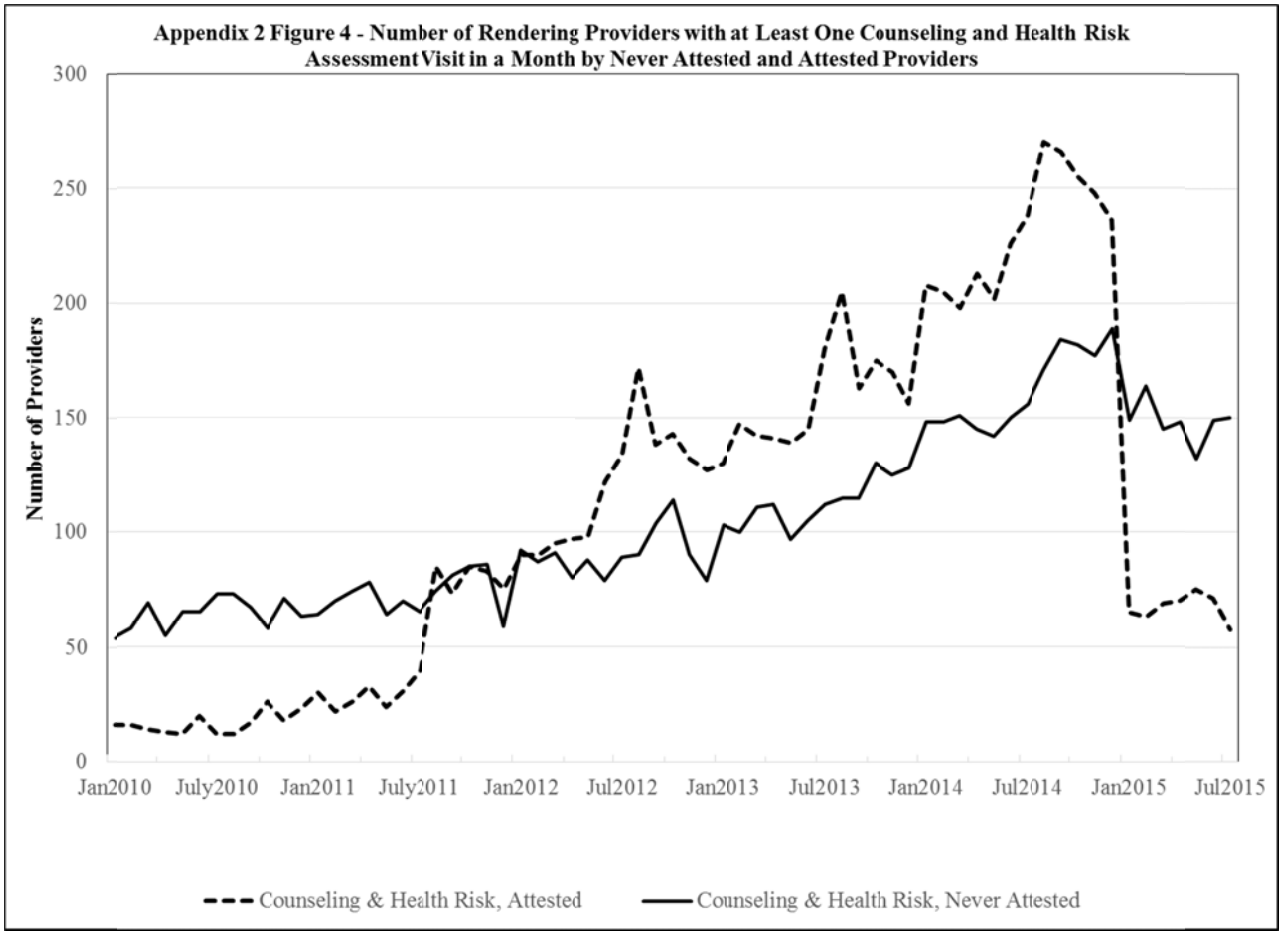
The time trends presented in Appendix 2 Figure 3 for the number of providers delivering one or more preventive medicine visits in a month reveal similar time trends as displayed in Appendix 2 Figures 1 and 2. The number of rendering providers that self-attested by December 2014 delivering preventive medicine visits increases at a relatively constant rate compared to never attested providers that essentially show no

increase from January 2010 through January 2014. As the Medicaid expansion begins in January 2014 and there is a rapid increase in the number of Medicaid clients, the number of never attested providers delivering preventive medicine visits begins to increase at a much higher rate compared to the number of attested providers that appears to have leveled off after an initial increase in the first few months of 2014. Finally, in contrast to Appendix 2 Figures 1 and 2, it is worth noting that more attested providers delivered preventive medicine services than never attested providers even though there were nearly twice as many never attested providers suggesting that attested providers are more likely to deliver this specific service to Medicaid clients.

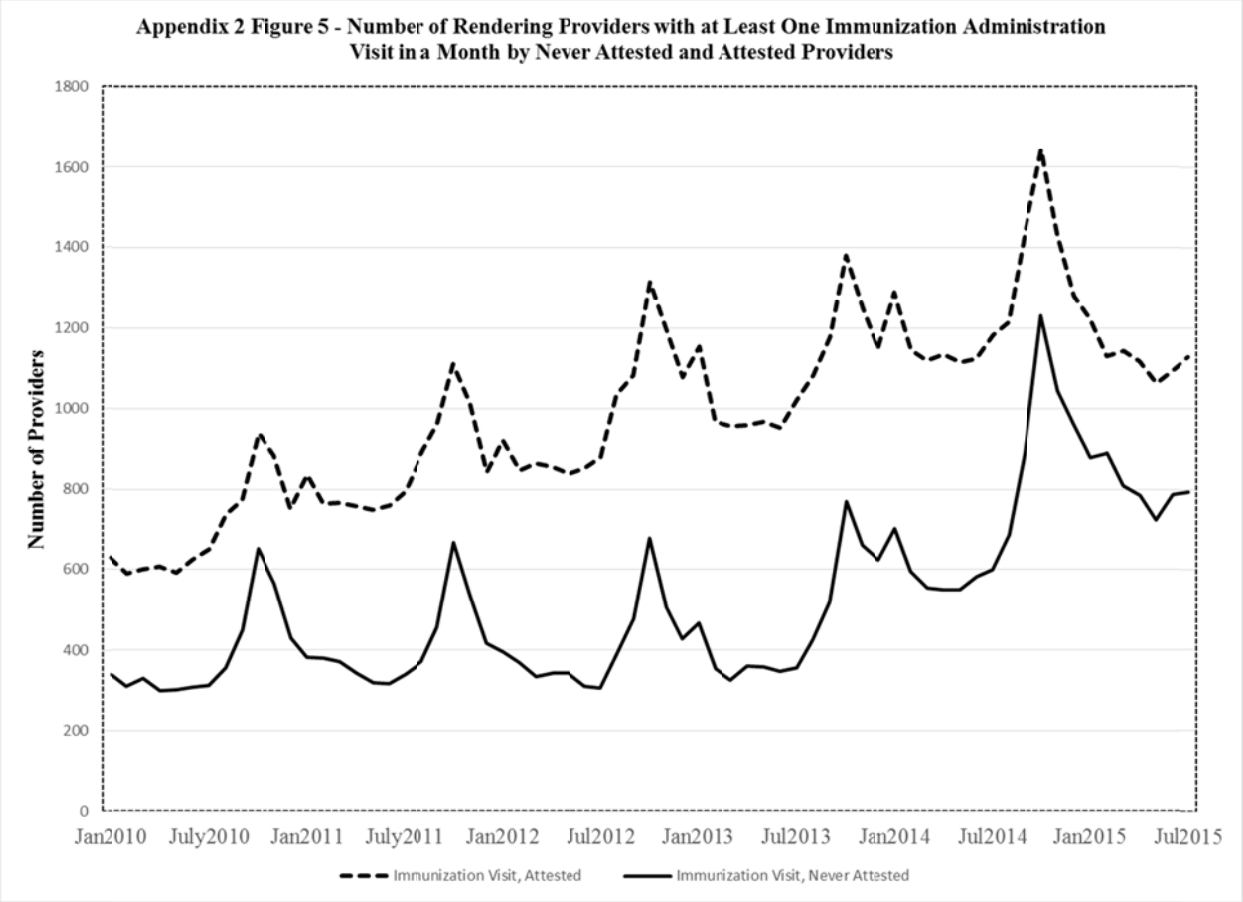


Appendix 2 Figure 4 presents the time series plots for the number of rendering providers delivering at least one counseling and health risk assessment visit in a month to Medicaid clients by never attested and attested providers. The time trends shown in this figure suggest factors other than the 1202 bump (January 2013) or the Colorado extension (January 2015) altered the number of providers delivering this service. For example, the differences in the trends for attested and never attested providers. Specifically, the noticeable increase in July 2011 and the relatively high rate of increase from July 2011 through June 2014 for the attested providers are noticeably different from the trends for never attested providers. Moreover, the sudden and significant decrease in the number of attested, and to a lesser degree never attested, providers from the last few months of 2014 through January 2015 just as the Colorado extension of the 1202 bump payments went into effect suggests there are other drivers of this service. Further exploration of this pattern in the delivery of this service is needed to understand whether this reflects a change in

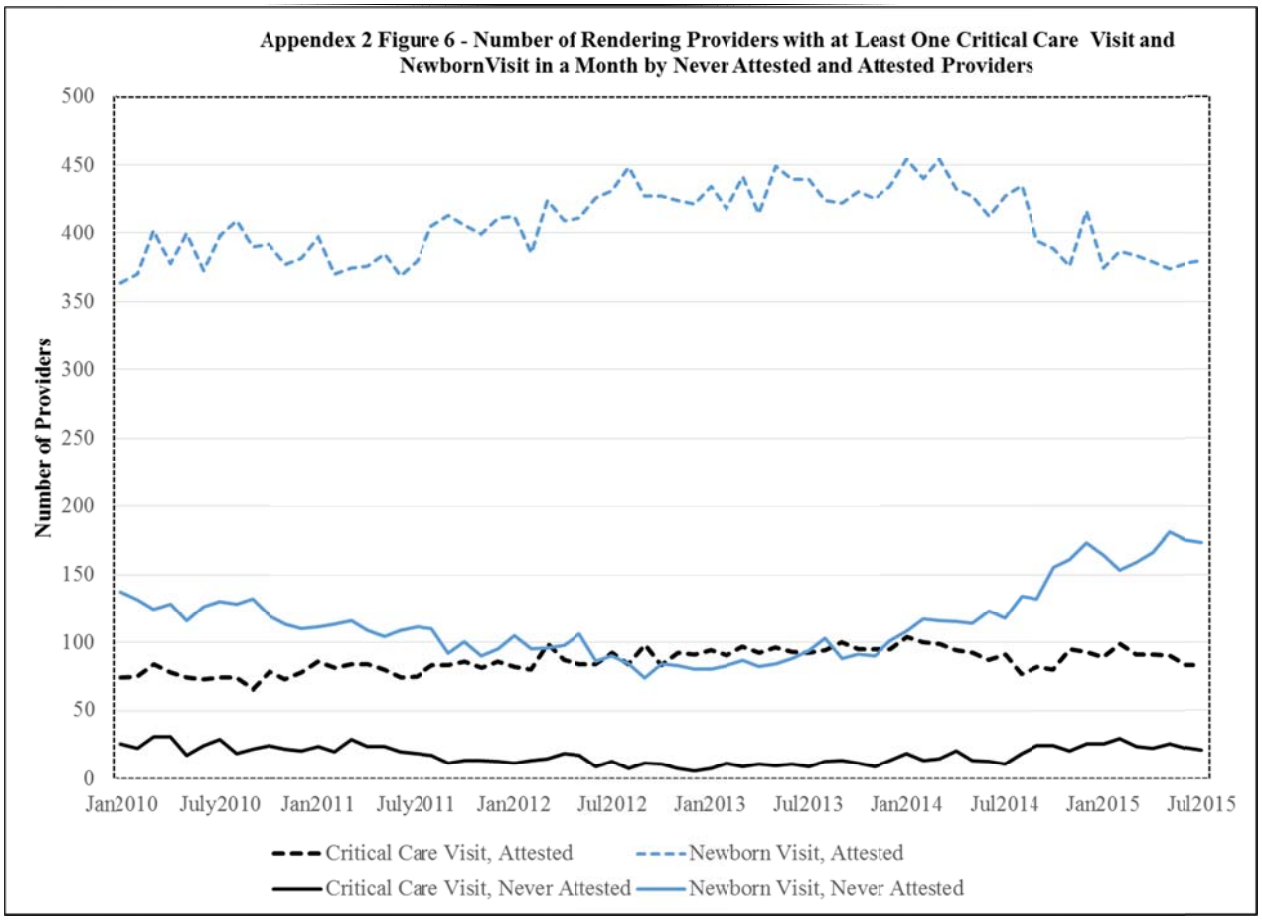
coding practices, which may justify a revision to the list of continuation-eligible codes in this service category, or a change in practice patterns for primary care providers.



Appendix 2 Figure 5 presents the time trends for the number of rendering providers with at least one immunization administration visit in a month by never attested and attested providers. As in the previous figures, the solid line presents the raw number for never attested rendering providers and the dashed line represents the raw number of rendering providers that attested before December 2014. There are clear seasonal patterns to immunization administration with peaks in October of every year. Looking behind these seasonal patterns, the time trends presented in this figure are very similar to the trends for preventative medicine visits. Specifically, the number of attested providers shows a steady upward trend over the entire time frame, whereas the number of never attested provides is relatively constant until 2014 when the number of Medicaid clients increased due to the expansion at which point there is a significant increase in the number of never attested providers delivering immunizations. Additional data are required to assess the extent to which this increase in the number of never attested providers continues or is a temporary response to the rapidly increasing number of Medicaid clients.

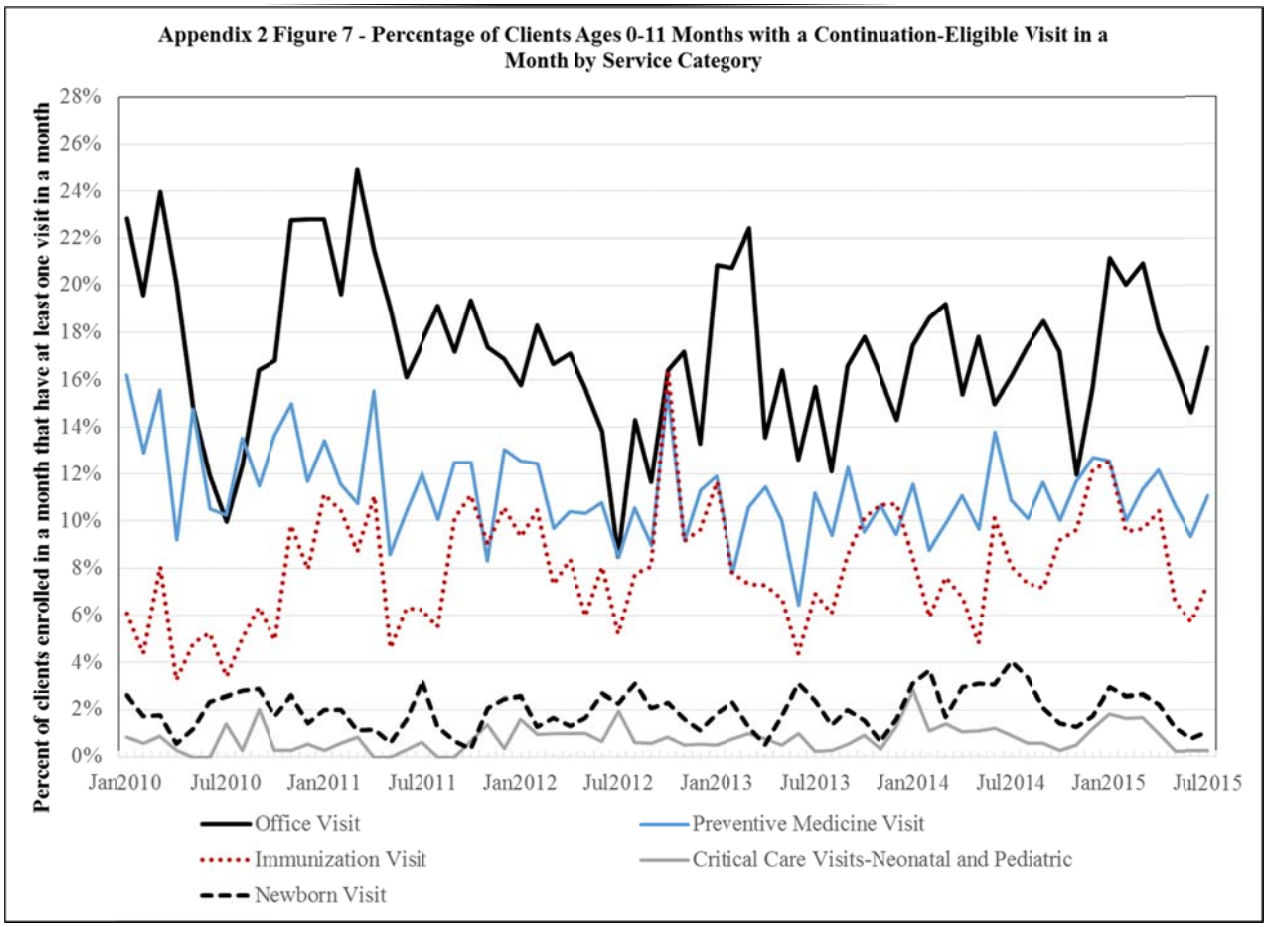


Appendix 2 Figure 6 presents the number of never attested and attested providers delivering one or more newborn visits in a month and the number delivering one or more pediatric critical care visits in a month in the continuation-eligible newborn and pediatric critical care service categories. Although reported together, each category was analyzed separately. As in the previous figures, the solid line presents the raw number for never attested rendering providers and the dashed line represents the raw number of rendering providers that attested before December 2014. In this figure, the black lines represent the number of providers delivering at least one critical care visit in a month and the blue lines present the number of providers delivering at least one newborn visit in a month. As shown in this figure, the number of attested providers delivering these services is noticeably larger than the number of never attested providers. A second feature of the plots displayed in this figure compared to the other continuation-eligible services is the relative lack of trends over time in both of these service categories. Apart from the increase beginning in 2014 for the never attested providers, the number of providers delivering services in these two categories is relatively constant. One possible explanation for these observed trends is that these services are primarily driven by the number of births and pediatric hospitalizations requiring critical care that are likely to not vary significantly over time. This would also likely explain the increase for never attested providers in 2014 as the expansion increased the number of Medicaid clients, including the number of childbearing age women.

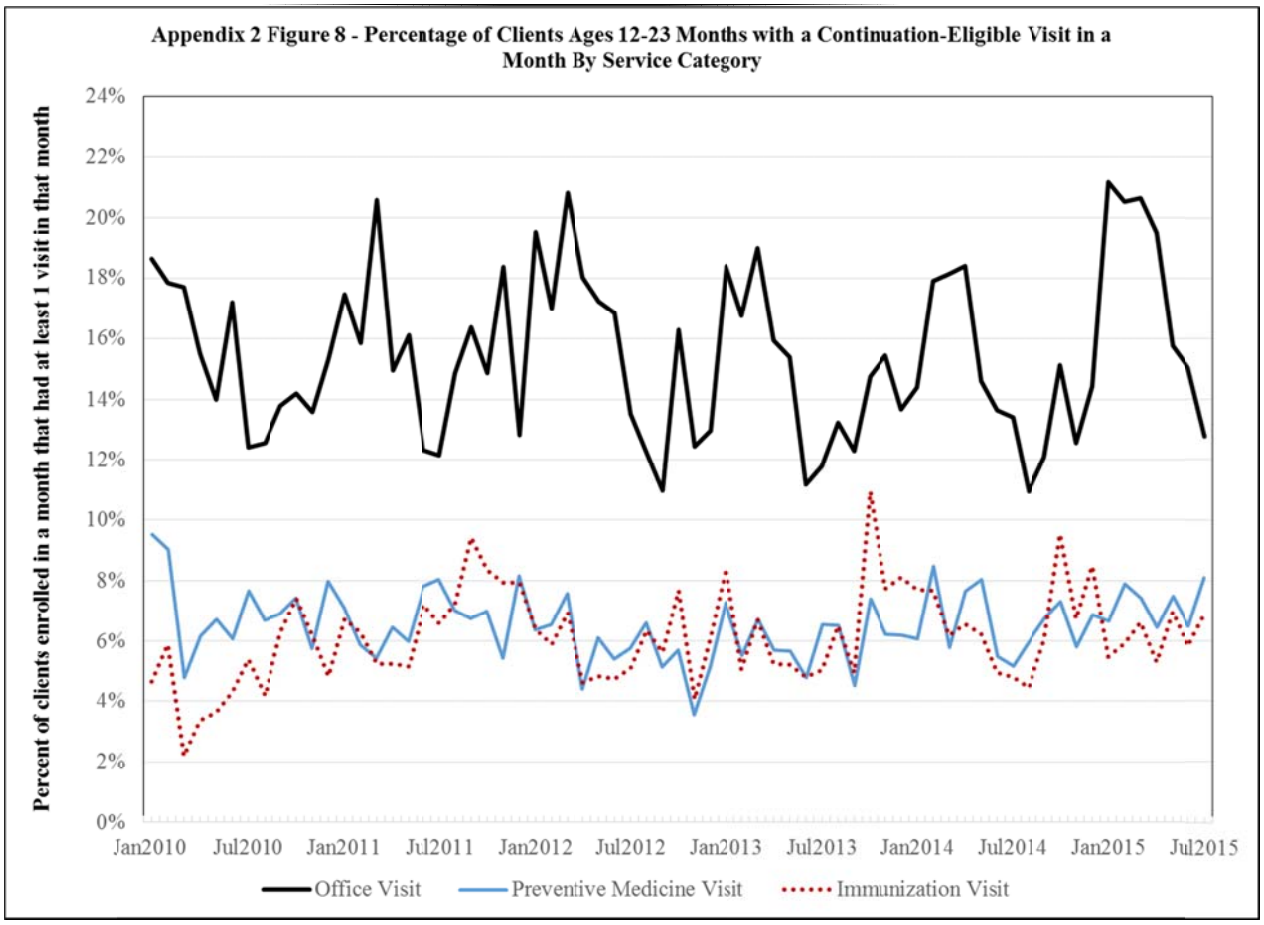


To provide an additional set of baseline measures for the continuation-eligible services we examined age specific client-based service utilization measures for clients age 0-11 months, 12-23 months, 2-6 years, 7-11 years, 12-18 years, 19-39 years and 40-64 years. Specifically, we calculated the percentage of clients in each age group. We only report measures that are relevant to age groups and the only three measures that are common across all age groups are office visits, preventative medicine visits and immunization administrations.

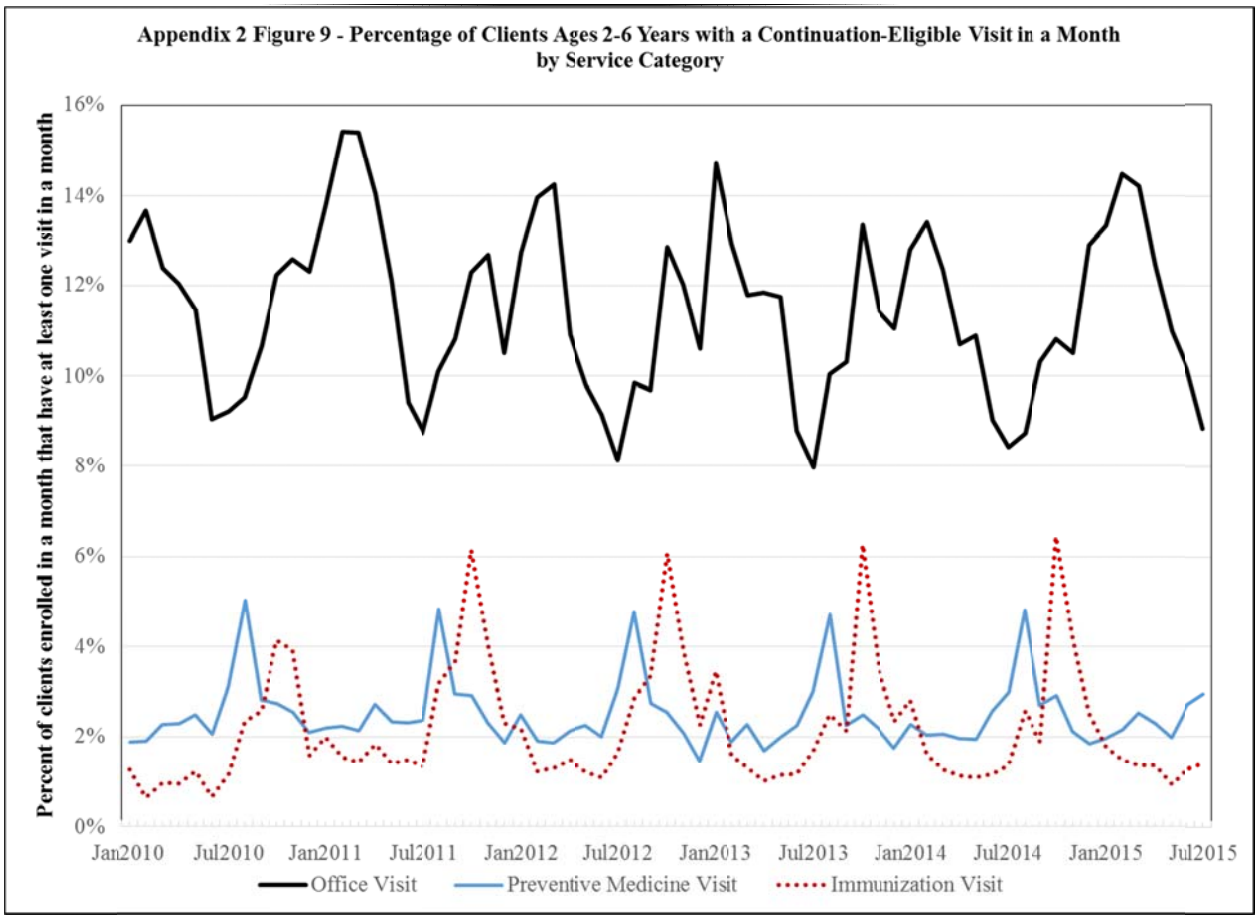
Starting with the youngest Medicaid clients, Appendix 2 Figure 7 presents the time trends for the percentage of children ages 0 through 11 months old enrolled in a month that had at least one continuation-eligible service visit in the month from January 2010 through July 2015. Five of the six continuation-eligible services are calculated for this age group. Primary care office visits are the most commonly experienced continuation-eligible service by this group of young Medicaid clients with 10% to 20% of clients in this age group having at least one office visit in a month. Preventative medicine visits and immunization administration visits are the next most common service received by this age group with newborn visits and pediatric critical care visits the least common. Abstracting from seasonal patterns, the time trends displayed in this figure suggest that the same proportion of Medicaid clients received these services even as the number of clients increased over this period. There is no indication that either the 1202 bump or the Colorado extension of the broader set of services affected the utilization of these services for this age group.



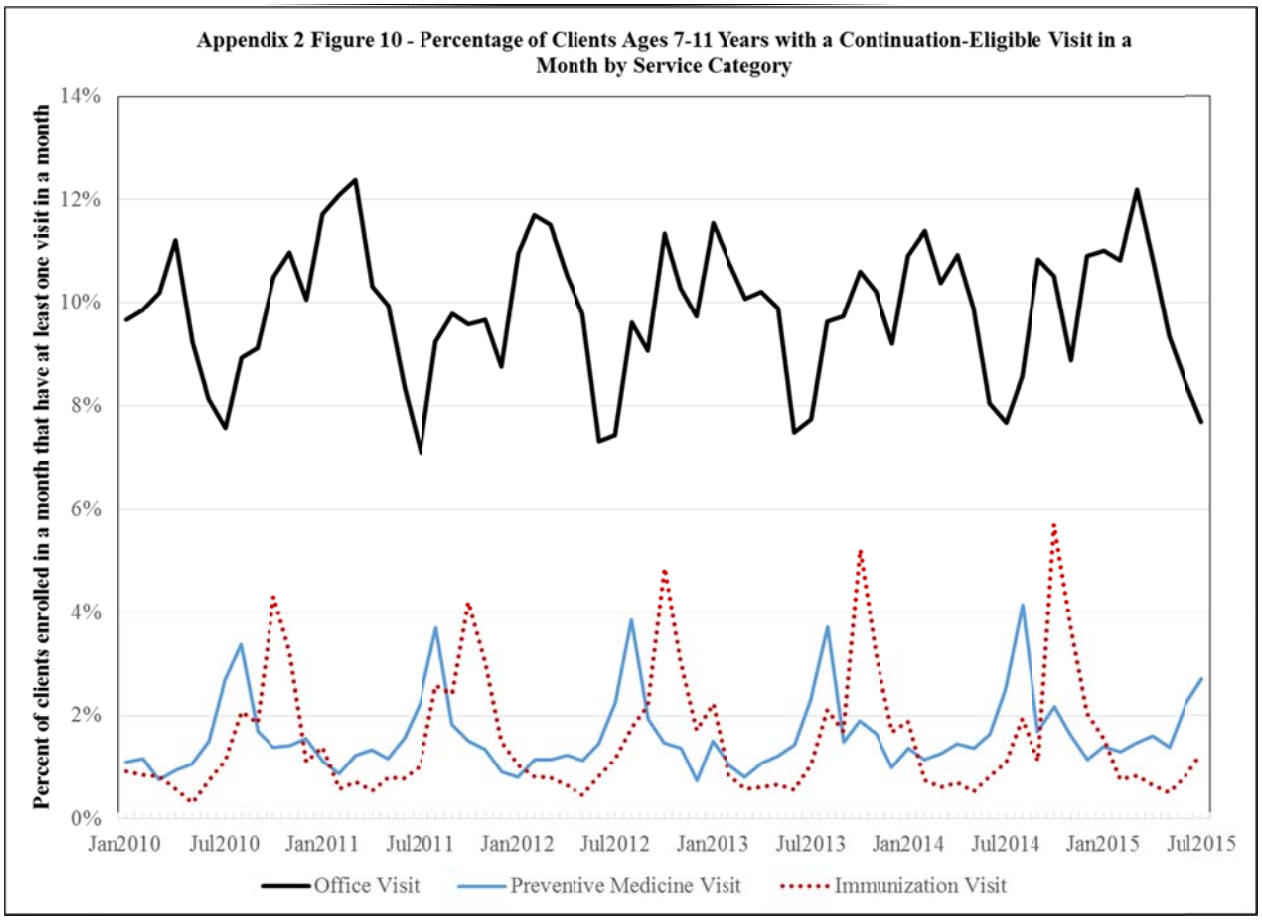
Appendix 2 Figure 8 presents the utilization measures for children ages 12 through 23 months old enrolled in a month that had at least one office visit, preventive medicine visit and immunization administration visit in the month from January 2010 through July 2015. The results in this figure are consistent with Appendix 2 Figure 7 where the continuation-eligible service most frequently experience by children ages 12-23 months are primary care office visits over the entire period. Similarly, abstracting from seasonal variation, the time trends shown in this figure as display a relatively constant utilization of these services by 12-23 month old Medicaid clients. The results presented in this figure also suggest that the 1202 primary care bump or the Colorado extension did not increase the percentage of children in this age group receiving any of these three continuation-eligible services in a month.



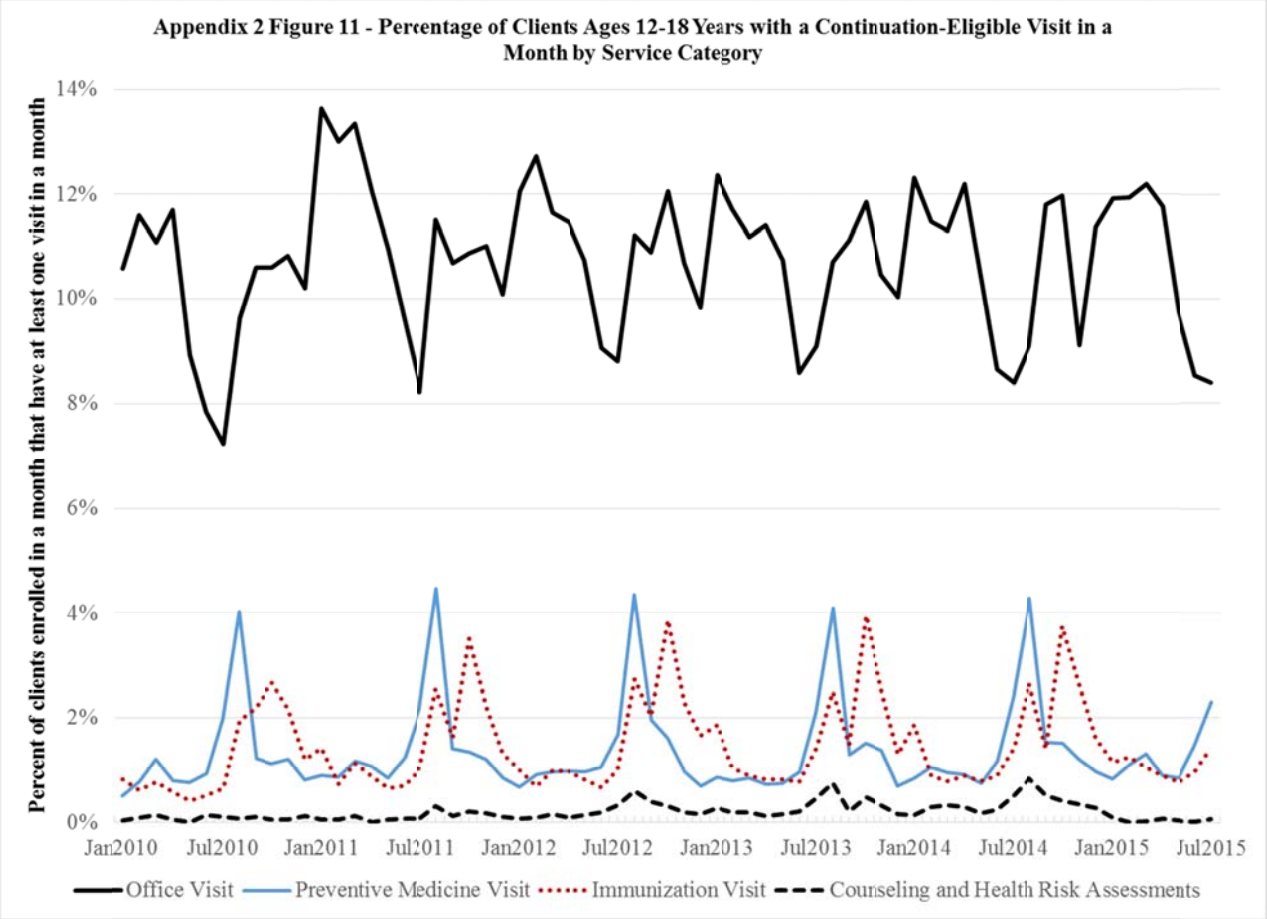
Appendix 2 Figure 9 presents these same three utilization measures for children ages 2 through 6 years old enrolled in a month from January 2010 through July 2015. The time series plots presented in this figure display similar patterns as shown in previous figures of utilization measures for younger ages. The most frequent continuation-eligible service experienced among children ages 2-6 enrolled in a month is primary care office visits although at a lower rate than younger ages with 8% to 15% of clients in the age group having an office visit in each month. Abstracting from seasonal variation the utilization of these three continuation-eligible service categories from January 2010 through July 2015 is steady. Again, the results represented in this figure suggest that neither the 1202 primary care bump nor the Colorado extension increased the percentage of children ages 2-6 years experiencing one of these services in a month.



Appendix 2 Figure 10 presents the time trends for the percentage of children ages 7 through 11 years enrolled in a month that had at least one visit in a month for the same three service categories from January 2010 through July 2015. The time series plots presented in this figure are very similar to the patterns shown in previous figures with similar utilization rates as we found for children ages 2 through 6 years of age.

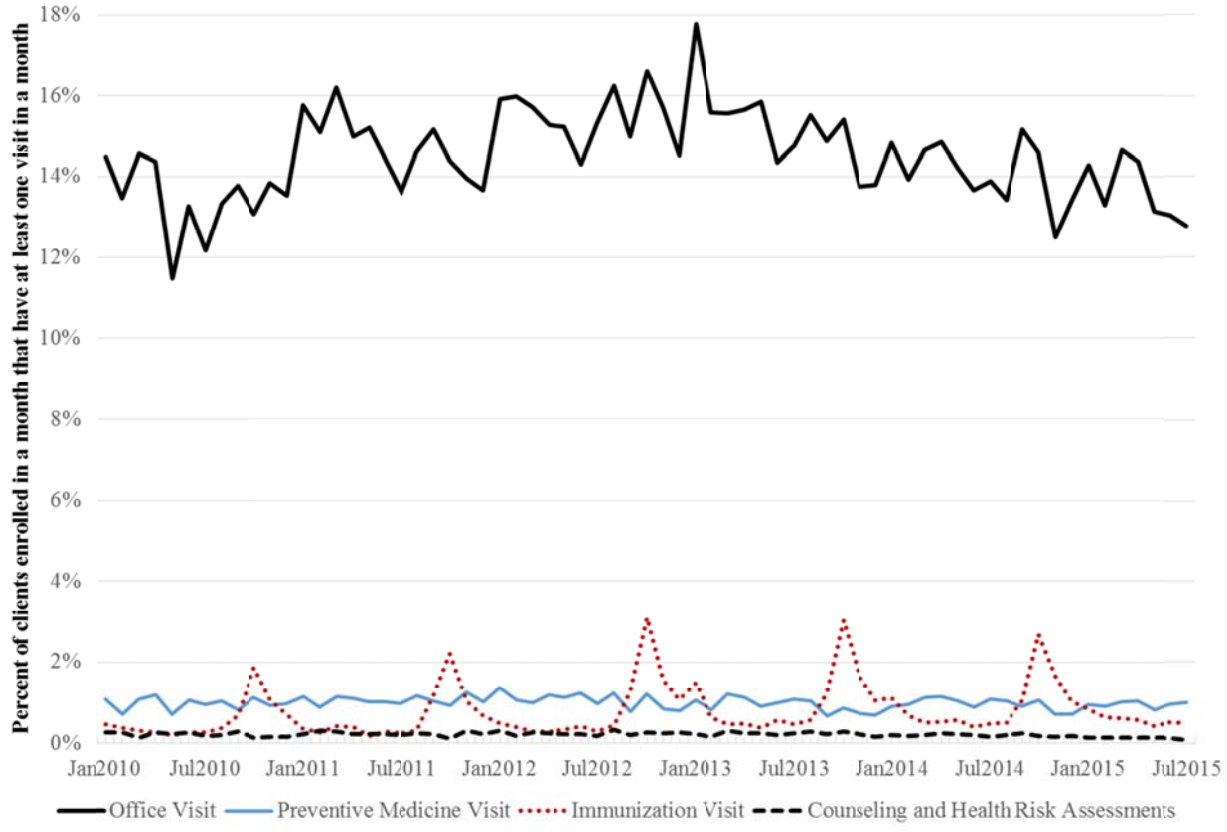


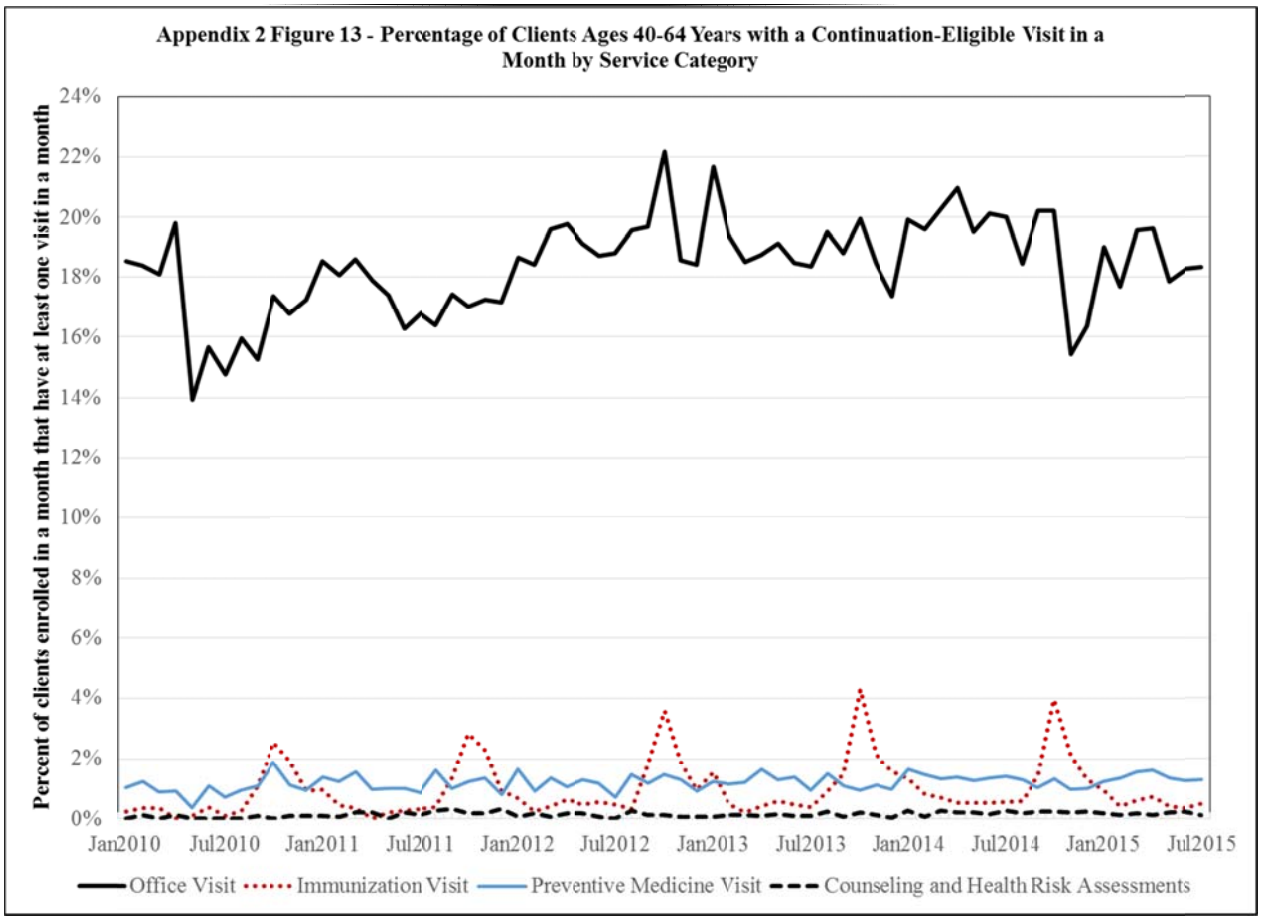
Appendix 2 Figure 11 presents the time trends for the percentage of children ages 12 through 18 years of age enrolled in a month that had at least one continuation-eligible service visit in the same three categories as well as visits for counseling and health risk assessment services from January 2010 through July 2015. The time series plots presented in this figure display similar patterns as shown in previous figures for office visits, preventive medicine visits and immunization administration visits. The percentage of clients in this age group experiencing at least one visit with counseling and health risk assessments services is less than 1% and displays a pattern that is consistent with the pattern shown in Appendix 2 Figure 4. Specifically, there is an increase following July 2011 and a corresponding reduction after July 2014. Again, the results represented in this figure suggest that neither the 1202 primary care bump nor the Colorado extension impacted the percentage of clients age 12-18 years old experiencing one of these continuation-eligible services in a month.



Appendix 2 Figures 12 and 13 present the time trends for the adult Medicaid population from January 2010 through July 2015. We included the same four utilization measures for these two age groups as the measures presented for clients age 12 – 18. Appendix 2 Figure 12 presents the findings for adults age 19 through 39 years old and Appendix 2 Figure 13 presents the findings for adults age 40 through 64 years old. The time series plots presented in these figures display very similar patterns as younger ages although the percentage receiving immunizations and preventive medicine services is lower than younger ages. As with all of the previous age groups, the results in these two figures for adult Medicaid clients suggest that neither the 1202 primary care bump nor the Colorado extension impacted the utilization of these services.

Appendix 2 Figure 12 - Percentage of Clients Ages 19-39 Years with a Continuation-Eligible Visit in a Month by Service Category




Appendix 2 Figure 13 - Percentage of Clients Ages 40-64 Years with a Continuation-Eligible Visit in a Month by Service Category
Percent of clients enrolled in a month that have at least one visit in a month
24%
22%
20%
18%
16%
14%
12%
10%
8%
6%
4%
2%
0%
Jan2010
Jul2010
Jan2011
Jul2011
Jan2012
Jul2012
Jan2013
Jul2013
Jan2014
Jul2014
Jan2015
Jul2015
Office Visit
Immunization Visit
Preventive Medicine Visit
Counseling and Health Risk Assessments