

West Virginia Bureau for Medical Services
And Marshall University Research Corporation
Data Analytics Pilot Program

Executive Summary

During the 2018 regular session, the West Virginia State Legislature passed House Bill 4001, relating to eligibility and fraud requirements for public assistance. This bill authorized the Secretary of the West Virginia Department of Health and Human Resources (DHHR) to develop a data analytics pilot program to identify potential fraud and help guide policy objectives to prevent and deter fraudulent, wasteful, and abusive provider behavior. As required by W. Va. Code §9-2-6(22), the DHHR hereby transmits this report on the West Virginia Bureau for Medical Services (BMS) Fraud, Waste, and Abuse Data Analytics Pilot Program.

Prior to this pilot program, BMS had relatively limited experience with the predictive analytic methodologies used to detect and prevent fraud, waste, and abuse (FWA). To meet the requirements of W. Va. Code §9-2-6(22), BMS awarded Marshall University Research Corporation (MURC) a jointly funded \$5.5 million project budget with 10% of the total project budget appropriated from state funds and the remaining 90% from federal contributions for the development and implementation of a predictive analytics FWA solution. To provide BMS with the most advanced and cost-effective solution available, MURC subcontracted with Qlarant Integrity Solutions, a nationally recognized leader in predictive analytics. This subcontract was awarded through a competitive procurement process completed by MURC. Over the past year, BMS has worked closely with the MURC and Qlarant to fulfill the requirements of the engagement and ensure that the pilot program results in the greatest return on investment possible for the state and federal governments.

BMS contributed to the design, development, and implementation of 53 Predictive Analytics data models, each of which was targeted toward inappropriate provider billing behaviors. This detection was accomplished through a process of applying the data models to the universe of claims submitted for reimbursement by WV Medicaid providers for dates of services within the fixed review period (7/1/2017 – 7/30/2019). The reliability of these model results was validated through a process in which subject matter experts reviewed model criterion and encounter data elements to reduce the potential for “false positive” findings in the result sets. By selecting a fixed review period beyond the timely-filing window for providers, BMS ensured the results of these models will continue to be valid and actionable over the coming months. In addition, these models and methods will be applied, within BMS analytic capabilities, to future review periods.

The pilot program’s data models targeted a wide variety of service areas and inappropriate provider billing behaviors. Models with potential recoveries included, but were not limited to: duplicative Evaluation and Management (E&M) services, modifier abuse, improper billing of global surgery procedures, suspicious referring provider relationships, inappropriate Diagnosis-Related Group coding, excessive billing of urine drug screens, therapy services, dental services, and Emergency Department visits. The models below are two examples of the analytics completed during the pilot program.

West Virginia Bureau for Medical Services
And Marshall University Research Corporation
Data Analytics Pilot Program

Model 25 detected suspicious provider relationships by analyzing ordering provider behavior and assigning risk scores based on the frequency at which ancillary services were ordered and the number of distinct entities receiving orders from the provider. BMS has initiated detailed reviews of four providers identified as high risk by this model. To date, one of these provider-reviews has resulted in the identification of a credible allegation of fraud which was referred to the WV Medicaid Fraud Control Unit (MFCU). This provider is now subject to an active MFCU investigation. For services rendered by this provider during the review period, the model estimates the potential recovery to be \$99,303.

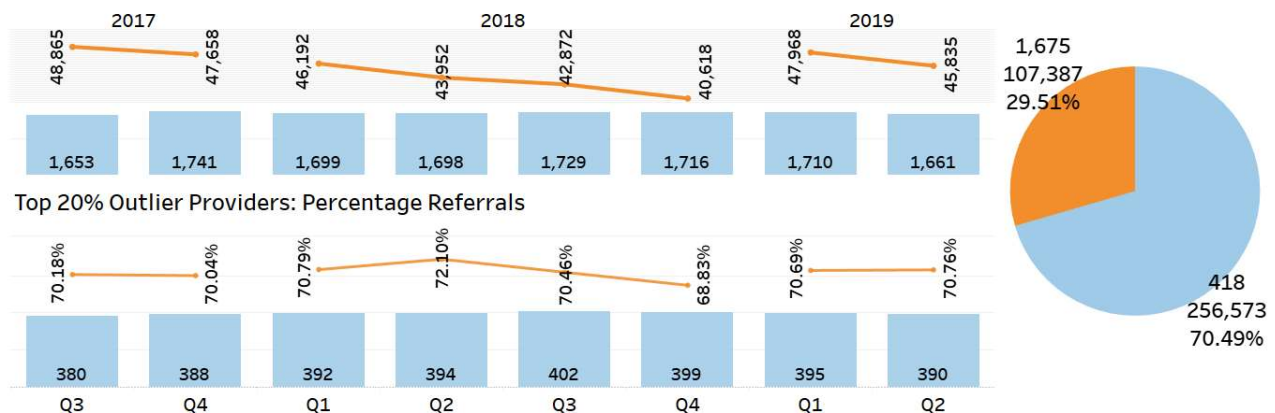
Model 025: Potential Improper Provider Referral Relationships

Outlier Summary

Distinct count of Outlier Provider	Outlier Encounter	Distinct count of Recipient ID
2,093	363,960	95,358

Comparing Total/Percentage Referrals Between Overall and Top 20% Outlier Providers

Outlier Providers: Total Referrals



Among the 53 models developed during this pilot program, BMS suggested nine, considered “exploratory” in nature, to Qlarant. These models assessed less common inappropriate provider behaviors which are not specifically addressed by current BMS policy. Such exploratory data models allow for recommending policy changes to mitigate opportunities for FWA. Model 4 identifies providers who billed face-to-face encounters for a single Medicaid member, for the same encounter purpose, five or more times over a 30-day period. These findings suggest that providers may attempt to inappropriately increase reimbursement by scheduling members for repetitive face-to-face encounters across multiple dates of service when all necessary services could have been delivered appropriately during a single encounter. An example of this type of excessive, potentially fraudulent, activity is extraction of one tooth per day performed across 6 distinct dates of service for a total of 6 teeth extracted over a 30-day period.

West Virginia Bureau for Medical Services
And Marshall University Research Corporation
Data Analytics Pilot Program

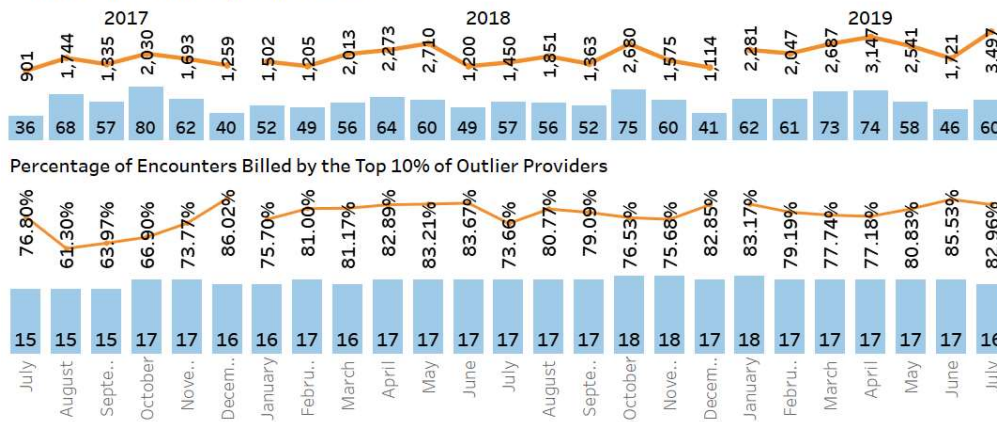
Model 004: Encounter Strings

Outlier Summary

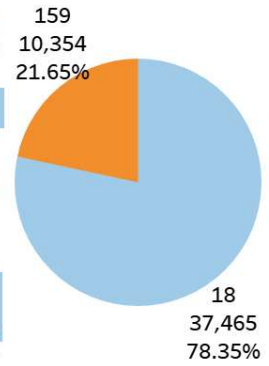
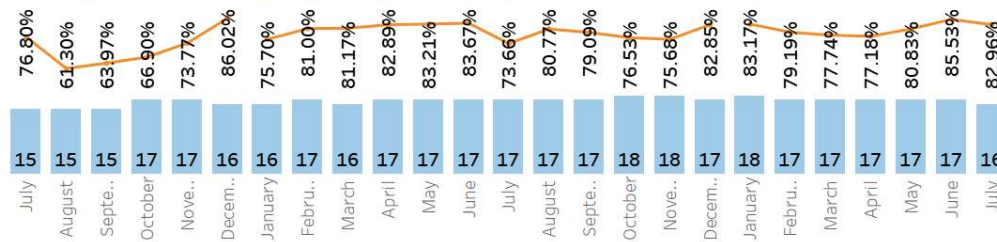
Outlier Providers	Total Encounters	Members
177	47,819	4,133

Comparing Total/Percentage Encounters Between Overall and Top 10% Outlier Providers

Total Encounters Billed by Outlier Providers



Percentage of Encounters Billed by the Top 10% of Outlier Providers



Once the predictive analytic data models were implemented, BMS determined that payments identified as inappropriate, also represent opportunities for cost avoidance in the future. To capitalize on this finding, BMS asked the MURC to propose claim adjudication business rules and provider education strategies designed to avoid costs generated by inappropriate provider behaviors. These proposed rules were derived directly from each model’s result data. Implementation of the business rules, within the capabilities of the WV Medicaid program and/or the Medicaid Managed Care Plans, may result in cost savings for all WV Medicaid stakeholders.

One example of the proposed business rules is based on the results of Model 45, which identifies instances where members are discharged from a hospital and admitted to a different hospital on a single date of service. Such transfers are necessary in some instances, due to the level of care needed by a member exceeding the capacities of the facility where they were initially admitted. However, in some circumstances this transfer can also result in Medicaid inappropriately paying both facilities for a full day of care. Model 45 identified a total of 105 such transfers billed by 39 institutional providers. Based on these findings, MURC estimated a potential cost avoidance of \$239,047.08 could be realized over a 3-year period, if BMS implemented the proposed business rule of reimbursing transfer cases on a graduated per diem basis up to the full DRG payment amount, effectively mirroring the reimbursement methodology used by Medicare for same-day transfers.

While this pilot program produced actionable findings, BMS also identified barriers which impacted this engagement and may continue to impact the integrity of WV Medicaid reimbursements. Some of the barriers include inconsistent medical claim and encounter data quality, span billing of institutional and personal care service claims, and limited integration of external data sources. Each of these barriers

West Virginia Bureau for Medical Services
And Marshall University Research Corporation
Data Analytics Pilot Program

increase the likelihood of overpayments being made and limit the ability of BMS to recover overpayments reliably and accurately. In addition to these barriers, it is important to note the timeframe of the pilot program was impacted by the COVID-19 Public Health Emergency (PHE). Due to the nature of the PHE and the cautionary measures implemented in response, the ability to engage with providers or obtain the medical records needed to substantiate overpayment determinations was delayed.

Through this predictive analytics effort BMS identified specific WV Medicaid providers at high risk for fraudulent behavior and several potential overpayments for which investigation continues. BMS also enhanced its knowledge and experience using predictive analytic methodologies to identify potentially fraudulent or non-compliant provider behaviors into the future. As a result, BMS is well positioned to effectively apply methodologies developed during this engagement to both past and future claims. While delays related to the PHE inhibited our ability to take action on model results during the engagement, which focused on the development and implementation of the analytic models, the results produced by these models remain valid and statutorily actionable during the 5 year lookback period and have been used successfully as the basis for 1 fraud referral to date. As vaccinations become more widely available and the PHE begins to recede, BMS is in the midst of resuming provider engagement and will, based on provider submitted records, take administrative actions to resolve improper payments. In addition to the return expected from these administrative activities this project has also produced both policy recommendations as well as claims edit proposals which have the potential to prevent future costs and strengthen the overall integrity of the West Virginia Medicaid Program.

This Executive Summary is followed by MURC's detailed technical report, complete with appendices reflecting the nature and outcomes of the data models, as well as the MURC and Qlarant team members involved in the pilot. This MURC report provides detail regarding the model-level development process; expected return on investment calculation methodologies; and proposed cost avoidance strategies. Finally, BMS would like to express its gratitude to all who participated in and supported this Data Analytics Pilot Program for their tireless efforts to meet the goals of this engagement.

Detailed Technical Report

Introduction

This project summary document provides a set of recommended strategies and actions to identify and mitigate fraud, waste, and abuse (FWA) in West Virginia (WV) Medicaid claims. The FWA project encompasses data collection, data and clinical validation, the development and implementation of rules-based (Quick Win) data, predictive, and risk modeling. As a result of the FWA project, the WV Bureau for Medical Services (BMS) has access to data models (Quick Wins) which were uniquely developed to assess specific billing behaviors of WV Medicaid providers. Based on the claims identified as outliers by these models, return on investment estimates were calculated reflecting the total recovery possible through administrative or law enforcement actions, as well as, the potential cost avoidance that could be realized through the implementation of business rules developed as part of this engagement. In this document, the “Quick Wins” are data models identifying the outcomes of the validated analytics and the use of claims data to explore underlying patterns of suspicious billing practices. With this information, BMS will proactively monitor provider behavior.

In this project summary, BMS is presented with a focus on the providers (types and identifiers), as well as the data model development and findings for model enhancements applied to education, expanded reporting, and improved service delivery. In addition, this summary document discusses strategies for continued FWA analytic development and utilization; specifically, the identification of different model types, e.g., the predictive and risk models.

A key aspect of this summary document is the discussion on the two types of calculated ROI. The first type of ROI analysis focuses on cost avoidance as distinct from the “pay and chase” payment recoupment. The second type of calculated ROI analysis is based on FWA referrals using a percentage of the dollars at risk for claims identified by the Quick Win models. The success of the FWA project is demonstrated by an enhanced quantitative and qualitative capability to identify fraud, waste, and abuse in the WV Medicaid provider populations using the data model outcomes discussed in this summary document.

The qualitative nature of the FWA project is reflected in the strategies presented in this summary document to potentially continue the FWA analytic development and utilization of new types of data, predictive, risk and ROI models.

Through this effort, BMS has successfully developed analytical capacities which have enhanced the Department’s ability to organize and direct operational actions. The results achieved during the FWA project will provide BMS with actionable data organized for “what-if” analysis, or sensitivity analysis, to systematically investigate the interactions of the data models by varying some of the model input parameters, such as, provider behavior and WV Medicaid policy changes, to maximize the precision and the reliability of the model predictions.¹

West Virginia Bureau for Medical Services
And Marshall University Research Corporation
Data Analytics Pilot Program

Beginning with the Data Model Results, and progressing to the Predictive and Risk models and the cost avoidance return on investment (ROI) analysis, BMS has a quantitative capability to execute a WV provider monitoring program, using sensitivity analysis, to evaluate existing and changed claims processing parameters and provider behavior, and to potentially increase Medicaid cost avoidance and savings.

This summary document reports on the “Quick Win” data model results and the derivation of the predictive, risk and ROI models, from the Quick Win models, that generate the actionable data for operational planning and policy enforcement execution in the WV Medicaid provider populations. In Appendix I of this report, a description of the model(s) summaries is included. In this section of the report, the proposed business rule(s) for the model(s) are outlined, along with the analytic results, cost savings projections, observations, and recommendations for operational actions to affect provider billing behavior. There is a recommendation that the proposed business rules/edit be implemented by the WV Medicaid Management Information System (MMIS) and the MCOs, such that the operational actions described in the FWA Project data models can be realized. In addition, there are two additional appendix sections in this report; Appendix II acknowledges the Marshall University Research Corporation and Qlarant Integrity Solutions project participants and Appendix III outlining the fraud, waste, and abuse models that were reviewed, but are not included in the final summary report. This is significant in allowing the reader of this report to view the scope of the fraud, waste, and abuse data analysis and review.

During the preliminary analysis of the FWA project results, it became apparent that certain edits would be helpful in identifying overlapping services and duplicative claims payments, when implemented alongside existing edits. In the “Possible Edits and Business Rules Affecting ROI” section of this report, two models are identified as examples of how the business rules can be developed and the edits applied to address potentially fraudulent provider behavior. In addition, the “Early Successes” section of this summary document describes several Quick Win data models that extend the value of the data models to realize cost avoidance results and increased claims overpayment returns over time.

This summary document is intended to be a working document, which identifies fraud, waste, and abuse behaviors in the WV Medicaid provider populations. Functional additions to the models, in the form of visualizations and dashboards, can potentially provide actionable data to BMS for claims payment recovery and educational opportunities to the provider populations.

Section 1: Data Model Results from Quick wins, Predictive, Risk and Return on Investment (ROI) Modeling

Project Objective and Review: As part of a competitive industry process, WV DHHR BMS requested that Marshall University Research Corporation (MURC) develop an analytic project

West Virginia Bureau for Medical Services
And Marshall University Research Corporation
Data Analytics Pilot Program

designed to assist West Virginia’s Medicaid Program in identifying and combating fraud, waste, and abuse (FWA). As implemented, the FWA project conducted an analysis of Medicaid claims data including medical, facility, pharmacy, and dental claims to detect fraudulent, wasteful, or abusive provider billing behavior. In addition, BMS asked MURC to propose a series of claims processing business rules, based on the analytical outcomes of the FWA data models, which describe a projected Medicaid cost avoidance return on investment (ROI) associated with these proposed edits. The WV Medicaid cost avoidance ROI analysis and generated business rules, derived from the original (53) FWA Quick Win data models, have been clinically validated as medically appropriate and representative of WV DHHR BMS Medicaid policy and practice.

In this project summary document, strategies are suggested to mitigate fraud, waste, and abuse, which are based on the findings and outcomes of the development, assessment and validation of predictive models that identify potentially fraudulent or wasteful WV Medicaid claims. As part of the model development, BMS and Marshall University Research Corporation (MURC) worked with clinical experts to validate the models to reduce “false positive” findings that incorrectly flag claims as potentially fraudulent, wasteful, or abusive. A detailed discussion of the management of the false positive findings in the data model results follows later in this section.

From the clinical validation of the data analytics results, MURC developed a series of business rules, or edits, to identify the extent of the inappropriate and/or fraudulent billing practices and the potential cost avoidance and recoupment of WV Medicaid claims. The “Quick Wins” data models are outcomes of the validated analytics and the use of claims data to explore underlying patterns of suspicious billing practices. With the Quick Win data models, BMS has the capacity to begin the proactive monitoring of provider behavior and the resulting claims processing outcomes. This summary document reports on the suggested strategies for mitigating fraud, waste and abuse in WV Medicaid claims and estimates the potential cost savings for each recommended Quick Win strategy. The model results outlined in this summary report also take into consideration the anticipated risk for claims payments made and for claims payments avoided. This is a significant finding and a primary input in calculating the return on investment (ROI) for the claims processed.

1.0 Cost Avoidance Return on Investment (ROI) Analysis

For the WV FWA Project there are two types of calculated ROI. The first type of ROI analysis focuses on cost avoidance, which is distinct from the “pay and chase” payment recoupment method. The second type of calculated ROI analysis is based on referrals for administrative or law enforcement recovery efforts using a percentage of the dollars at risk for claims identified by the Quick Win models. The WV Medicaid cost avoidance ROI analysis is an analytical-based process using the sampling data from the WV MMIS claims data generated during a two-year period (7/1/17 – 7/31/19) and validated for completeness and accuracy. Both the cost avoidance and claims referral-based ROI calculations are focused on the payment results derived from the Quick Win data models, which encompass data exploration, the development of clinically validated

West Virginia Bureau for Medical Services
And Marshall University Research Corporation
Data Analytics Pilot Program

business rules, and the predictive and risk analytics to project potential cost avoidance and payment recoupment.

For the referral-based ROI calculation, a composite risk score across all the Quick Win data models is used to determine the highest priority outliers, this is a risk score of 70% or greater. For the cost avoidance ROI calculation, the probability of risk reduction is 50% and is used on a model by model basis. Each calculation method is appropriate in identifying and quantifying the payments at risk and the potential proactive (cost avoidance) and reactive (claims referral) potential ROI.

The result produced through these modeling and editing efforts facilitates the identification and reporting of provider outliers based on billing behaviors demonstrated during the review period. This is a significant accomplishment of the FWA project and an opportunity for BMS Office of Program Integrity (OPI) to continue developing strategies and analytical models to improve on the ROI calculations.

- 1.1 ROI Analysis Development:** The ROI analysis, based on FWA cost avoidance, uses selection rules, e.g., estimates of type I (false positive) data errors and a percentage of the dollars at risk for claims identified by the Quick Win models to refine the overall ROI amount to a realistic outcome.
- 1.2 Type I Data Errors and Data Quality:** In the selection rules, the ROI analysis calculates, by data sampled, the low and high estimates of potential return. The estimates are based on a Type I data error rate, between 5% (low estimate) and 20% (high estimate), for the cost avoidance potential return, and outlier likelihood based on a calculated risk score. In applying the false positive rate to the model data results, the FWA project accomplishes a proposal objective, defined in the Marshall University Research Corporation, Medicaid Fraud, Waste, and Abuse Services Proposal No. WVMDFRAUD, section 5.1.2.2, page 34. In addition to the Type I false positive rate, the cost avoidance ROI calculation and outcome applies a 50% probability of risk reduction to the claims payments at risk. For the referral-based ROI calculation, a composite risk score is used to identify the highest priority providers for pursuit based on the likelihood of return, which is measured at 70% or greater.

In validating the FWA data results for the cost avoidance ROI, the Type I error rate is used as a statistical test, e.g., a random data sampling, to assess the null hypothesis (H_0). For the FWA project, the null hypothesis is as follows, "the WV Medicaid outcome, using the FWA data models, is correct in identifying fraudulent provider behavior or claims paid inappropriately due to provider fraud, waste, or abuse." The results of the data outcomes will be sampled to test whether the null hypothesis is positive (the provider is an outlier) or negative (the provider is not an outlier). The specific risk factor applied to either the cost avoidance ROI calculation (50%) or the referral-based ROI calculation (70%), help to identify the outliers and the claims payments at risk. With these results, BMS has a range of action that can be taken, e.g., request medical records, recoup identified overpayments, require provider education, make a referral to law enforcement, or compare future provider

West Virginia Bureau for Medical Services
And Marshall University Research Corporation
Data Analytics Pilot Program

behaviors to the behaviors observed during the review period. In evaluating the actions to be taken, BMS further considers the Type I (false positive) error a refinement to the proactive cost avoidance ROI estimates.

1.2.1 Type I Error Rate Significance: Traditionally, in statistical testing and data sampling of the results, the Type I error rate is relatively low, typically, 5 out of 100 data results are in error.² This is referred to as the “level of significance,” e.g., the probability of rejecting the null hypothesis in a statistical test when it is true — also referred to as the significance level.³ The 5%, and below level is typically due to chance. The Type I error rate can increase with repeated statistical testing that samples and compares the average outcome of the null hypotheses across several disjoint populations. For the FWA model development, an ensemble method was used to obtain better predictive performance than could be obtained from a single learning algorithm. Potentially, using an ensemble method to collect and analyze multiple data samples can result in outcomes that are being treated as generally equal (homogenous) to each other.⁴ This sampling method can raise the false positive error rate above the level of significance, which affects the ROI calculation. In calculating the cost avoidance ROI, the high-end Type I error rate of 20% and a 50% likelihood of return is used. The 20% high-end error rate was selected based on empirical data derived from auditor and analyst review and validation. For the claim’s referral-based calculation, a composite risk score is used, which is explained in detail in section 6.1.2 of this summary document.

1.3 Quantitative Measure: The cost avoidance ROI calculation and analysis is an estimate of a potential return, or savings, for claims that would not be paid because of the implementation of the recommended claims processing business rules. The referral ROI calculation is an analysis based on data sampling and cost savings potential after the claims are paid. The primary difference between the cost avoidance and referral-based ROI analysis is the provider monitoring necessary to assess the impact of newly implemented cost avoidance methodologies. With the cost avoidance method, BMS will monitor the provider claims processing behavior to determine the degree of change over an ensuing three-year (prospective) period. The results achieved during this prospective monitoring period will be compared to the historical data results used to generate the business rules and edits required to identify provider behavior to determine the true impacts of these preventative, cost avoidances methodologies.

1.4 Implementation: Cost Avoidance ROI Analysis: The development of the Quick Win model criteria is based upon the WV Medicaid policy which is analyzed to identify and define inappropriate provider behaviors within the Quick Win models. Many models incorporated the billing codes for services rendered as part of the model criteria which allowed BMS to review policy adherence by providers resulting in the identification of outliers to pursue based on the following categories; payment recoupment, educational opportunities, and fraud investigations. The FWA project was successful in identifying outliers that fell into all categories.

West Virginia Bureau for Medical Services
And Marshall University Research Corporation
Data Analytics Pilot Program

- 1.5 Edits:** The focus of the cost avoidance ROI analysis is to present the objectives of the Quick Win data models, the business rules derived from the data models, the assumptions for the claims data sampling, the cost to implement the business rules and the potential cost avoidance that is possible through implementation of the proposed business rules. A significant number of the business rules were developed as edits to the WVMMS. As edits, the business rules are the starting point to determine the potential cost avoidance value to BMS. This value is measured as a potential return on investment (ROI) if the business rules are executed and the provider populations are prospectively monitored for policy compliance.
- 1.6 Edit Process:** The WV Medicaid cost avoidance ROI analysis begins with the review of the business rules derived from the existing BMS FWA Project Quick Win data model criteria; from the business rules, a potential WV Medicaid claims payment reduction in payments is calculated as a value used to derive a return on investment (ROI). The projected ROI is an economic measure, which is used as an indicator of potential economic benefit (reduction in payments) for the WV Medicaid program. The analysis of the economic benefit and the generation of the business rules comes from a review of the FWA model criteria and the corresponding results.
- 1.7 Methodologies for ROI Calculation: Model Outcomes:** The ROI calculations created in this engagement are specifically intended to provide an accurate accounting of the likely return from items found through the analysis completed through this effort; items such as cost avoidance, claims recouped for overpayments or fraud. This analysis was done using two calculations: The first calculation was based on FWA referrals and is calculated using a percentage of the dollars at risk for any claims identified by those models. This calculation was conducted using random sampling and an ensemble method of analysis to categorize the full set of claims; all BMS selected models were included in the referral ROI calculation, all claims and providers, complying to the risk selection criteria, were identified and evaluated during the calculation. The second calculation was conducted using a series of selection rules, e.g., estimates of type 1 (false positive) data sampling errors, and selected edits applied to the Quick Win data models, which are intended to reflect the expected ROI.

Within the referral ROI cost calculation, a risk score threshold of seventy percent (70%) was used to distinguish those providers presenting the greatest risk and most likely to be subject to an investigation by BMS. In addition, each model and outlier type within the model was labelled by the likelihood that medical records will be needed to recover claims identified as overpayments, as well as a percentage of the total dollars potentially recouped. Using random sampling and an ensemble method to categorize the full set of claims, all BMS selected models were included in the ROI calculation. As a quantitative measure, the ROI calculation and analysis is an estimate of a possible return (recoupment, or savings on claims already paid) for BMS. The second ROI calculation was an analysis based on projected cost avoidance if certain claims processing business rules were implemented by BMS. The cost avoidance nature of this ROI analysis requires prospective monitoring for changes in provider billing behaviors over an ensuing three-year period.

The results achieved during this prospective monitoring period are compared to the historical data results used to adjust the original business rules and edits used to identify inappropriate provider behavior.

Section 2.0 Data Quality for Provider Identifiers, Claims, Types, and Place of Service

The FWA data models and the ROI calculations are provider-centered analytical outcomes. Within each model and analyses, there are clear assessments of providers enrolled in the WV Medicaid Program. During the analysis of the WV Medicaid claims data, it was determined that additional data refinement was necessary in many cases to research the provider identifier fields in the claim line data; specifically, the ordering/referring provider identification for the service areas, such as DME, laboratories, independent radiology, and physical therapy. In the review and analysis of the FWA models, data refinement is a process of improving the quality of the claim's dataset subject to analysis.

2.1 Review and Analysis: To facilitate a high-level outcome of data review and analysis, a significant number of the business rules/edits in the cost avoidance and referral ROI were written to verify the servicing/ordering/referring provider is appropriately identified on the claim. The FWA data model edits check the registration of all providers indicated on a submitted claim or encounter record.

2.2 Claims and Data Quality: All WV Medicaid claim types vary by medical service content and payment structure. During the WV FWA project, care was taken in the development of the analytical models to confirm the accuracy of the claim data. This careful consideration of the claim data resulted in high performing FWA data models and accurate claims reviews. Critical to these reviews were the examination of the claims billed by diagnosis related group (DRG), and the review of data fields such as revenue code, patient status, admission data and discharge date. Professional claims, another type of claim data, use date of service (DOS), procedure code, modifiers, and place of service to represent the content of the medical service rendered to the patient. The complexity of the WV Medicaid claims data is accurately represented in the FWA data models developed for complex data analytics.

2.3 Provider Types and Place of Service: Maintaining and improving on the accuracy of the provider enrollment and provider type data will require ongoing efforts by BMS as well as all stakeholders in the WV Medicaid Program. This work is generally considered routine data maintenance and can be incorporated into periodic updates to the data sets and, by default, to the data models. In the FWA data models and both calculated ROI outcomes, the medical claims were used effectively to identify professional, inpatient and outpatient claim types involving all payers, and places of service. As a data quality check and enforcement of the data integrity rules, the data models were specifically designed to consider the provider types and place of service in the claims data, thereby allowing BMS to validate as accurate the data analytical outcomes. A key result of the model data validation process and data quality check

West Virginia Bureau for Medical Services
And Marshall University Research Corporation
Data Analytics Pilot Program

of the claims is the capability for BMS to operationalize the FWA data models using actionable data for further cost avoidance actions, provider training, and claims pursuit.

Section 3.0 Data Model Development and Findings: WV Medicaid MCO Policies with Model Criteria for Early Successes

The criteria developed for the Quick Win data models are based on the WV Medicaid payer policies, which serve as a set of coverage standards for all payers participating in the WV Medicaid Program, to identify providers as outliers and the payments at risk. A selection of the billing codes for certain services were included in the development of the models. In the potential future development of FWA data models, codes specific to non-State payers can also be incorporated, and as a result encompass a greater portion of the claims paid by the WV Medicaid program. In this section of the summary report, the model development process focuses on specific models and types to identify potentially inappropriate services and early successes; both outcomes are important to show the immediate value of the project and the potential impact on the WV Medicaid Program.

3.1 Model Development: In the model development, BMS suggested that providers be identified who potentially engaged in fraud, waste, or abuse to increase payment reimbursement from the WV Medicaid Program. One example of this request was the development of a model (Model 04) to identify providers who bring the recipient back into the office multiple times per month, when potentially a single visit for a specific treatment is more appropriate. There is currently no specific policy defining the criteria or medical necessity required to justify this type or frequency of service delivery. The flexible nature of the data models and the ROI business rules developed during the FWA project allow BMS to build exploratory models like Model 04, a type of model used to effectively monitor the questionable practices of a provider and to alter WV Medicaid policy affecting both the MCOs and the recipients. With these policy changes, the same model will be able to detect the providers following the new BMS policy and report a change in billing behaviors resulting from the new guidance.

3.2 Exploratory Models and Findings: Data exploration is a significant factor in identifying and pursuing new issues that reveal themselves through routine analytics development. Provider organizational structures and potential fraud schemes are constantly evolving, therefore maintaining regular exploration of the provider(s) who service the WV Medicaid population is key. During the model requirements definition, one example of developing key metrics of interest was identified with Model 30. With this model, providers who billed multiple providers identified under a single federal identification numbers (FEID) were identified as being suspect of potentially improper relationships not previously disclosed through the enrollment process. This type of explorations can determine, through billing behaviors and provider relationships, potential improper referrals, or inappropriate service utilization not easily identifiable through enrollment and screening data alone.

3.3 Identifying Improper Provider Referral Relationships: The identification of improper provider relationships is a powerful tool and an area where significant fraud has been identified nationally. An important component of this model reporting is the integrity of the data; one of the initial models developed to identify these improper provider referral relationships is Model 25. By analyzing claims data from all WV Medicaid payers, this model has the capacity to identify inappropriate multi-payer provider relationships, which could not have been identified otherwise.

3.4 Early Successes: In this section of the summary report, a more expansive discussion of the FWA data models is presented to describe the early successes of the project. The models selected show the purpose of Fraud, Waste, and Abuse project claims analysis, the business rules/ WV MMIS edits, and the financial potential for cost avoidance. Models included are: Models 02, 03, 05, 08, 25 and 40. A complete review of all 53 Quick win models will be described in the appendix section of this summary report.

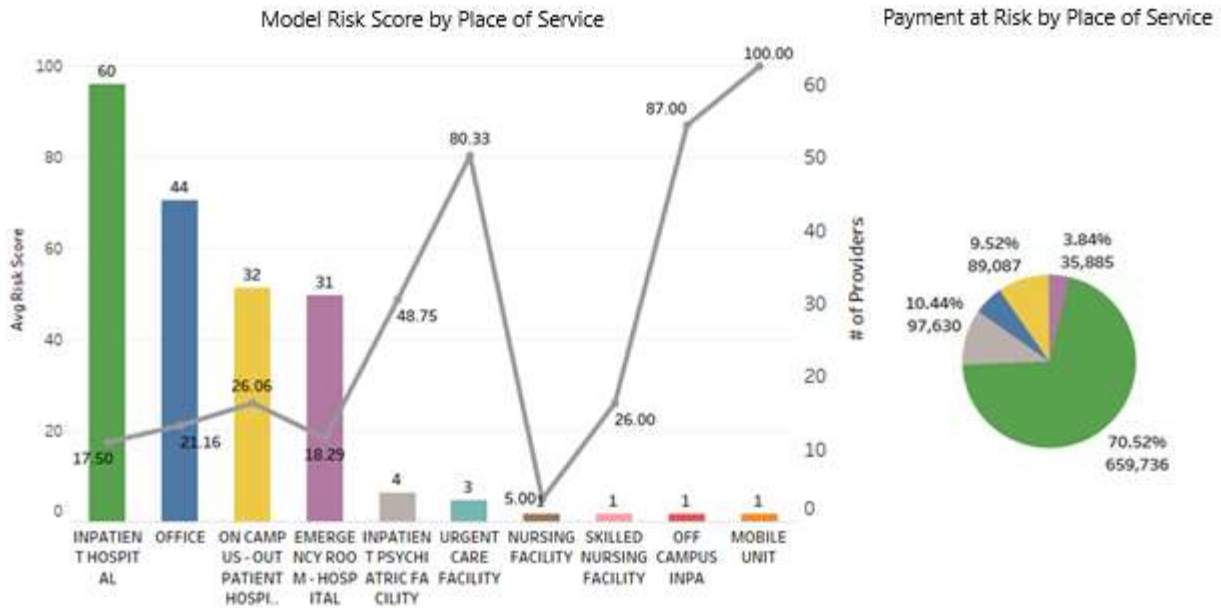
Model 02: Group Practice Duplicate Billing:

The purpose of this model is to identify the providers who treat and bill, multiple times in the same group practice, on the same date of service (DOS), the Evaluation & Management (E&M) visit for the WV Medicaid covered life. In the WV Medicaid policy, an E&M visit can be billed more than one time for each date of service (DOS) if the service provider has a different specialty. Traditional editing for potential duplicates has the same billing, the same code, and the same Billing provider. By modifying the billing process to show hospital-based E&M services as a different service may also create a duplicate billing and violate policy. Under specific conditions, evaluation and management codes can be billed more than once in a particular date of service, but only when the patient has 2 or more distinct complaints or when the service is rendered by 2 or more providers with distinct specialties. Otherwise, submitting multiple E/M codes on the same date of service would be considered duplicate billing. As a result, the corresponding medical records must be requested, obtained, and reviewed prior to initiating recovery efforts against claims identified by this model.

In developing the business rules for this model, it is recommended that a check for duplicate billing be performed to include the following: the identity of the provider, and a determination be made that the E&M claim falls within the CPT code range 99201 to 99499. If the claims are discovered in this range, and the servicing provider is from the same specialty, then the claim is considered a duplicate. ***In analyzing the WV Medicaid claims for group practice, duplicate billing, the potential cost avoidance is significant at \$362,199.*** The following visualization details the results of the Group Practice Duplicate Billing quick win model. The data results are presented by payment at risk by place of service (POS).

West Virginia Bureau for Medical Services
And Marshall University Research Corporation
Data Analytics Pilot Program

Outlier Providers	Payment	Claim Count	Claim Line Count	Members
96	935,498	9,184	12,527	3,311



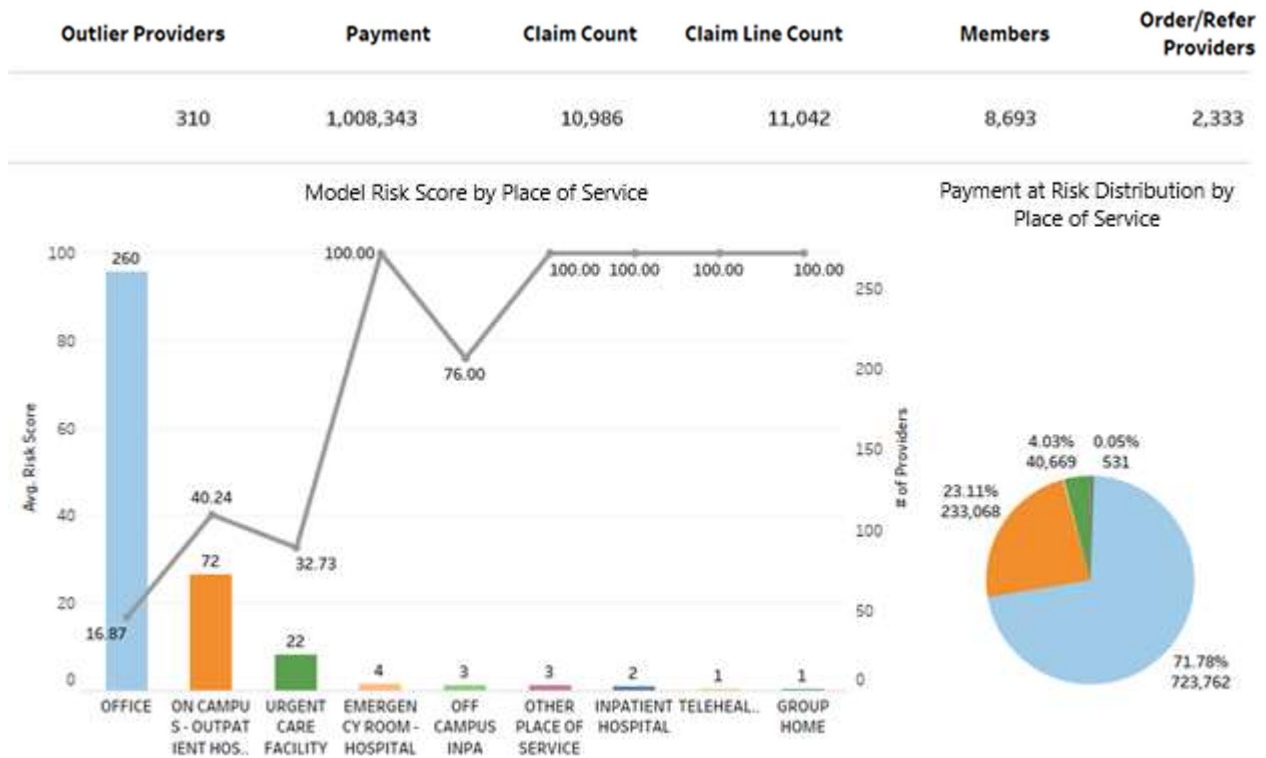
Model 03: New Patient Churning:

The purpose of this model is to identify providers who bill new patient visits for members with whom they have a preexisting relationship or who have chosen to enroll with a different WV Medicaid payer e.g., moving from FFS to MCO or from one participating MCO to another. An example of this change would be a new Medicaid FFS member visiting a provider and the provider subsequently billing for a new patient Evaluation and Management visit (code range: 99201 to 99205) when the patient changes to an MCO and returns to the same provider within a 3 year period. Pursuant to both state and federal guidelines providers are required to bill this service as an existing patient Evaluation and Management visit (99211 to 99215), which reimburses at a lower rate, due to the fact that this member has a previously established relationship with the provider during the prior 3-year period and the provider should already be family with the member and their medical needs. If the provider bills for a new patient E&M visit, assuming that the member has been seen by the provider within the past 3 years, this is considered “new patient churning.”

The business rules for new patient churning are developed to detect the member who receives treatment from the same provider group, with the same specialty, in a three-year period and is billed as a new patient. In this case, the edit would deny the claim. ***The financial impact with new patient churning in the WV Medicaid population is approximately \$391,337 during the three-year historical review of the WV Medicaid data.*** The following visualizations details

West Virginia Bureau for Medical Services
And Marshall University Research Corporation
Data Analytics Pilot Program

the results of the New Patient Churning quick win model. The data results are presented by payment at risk by place of service (POS).



Model 05: MCO Capitation After Death

The purpose of these models is to identify the MCOs who received capitation for individual members who, in the prior month(s), appear to have been deceased according to current Vital Statistics data. Under claims payment rules, the MCO is required to return as any monthly capitation payments made for a service month during which the member was not alive. Both models show the use and integration of the external vital statistics records from the Health Statistics Center's (HSC's) Vital Registration Office, which reports all births, deaths, marriages, divorces, fetal deaths (miscarriage or stillbirth after 20 weeks of gestation), and ITOPs (induced termination of pregnancy regardless of gestation period). These vital records are analyzed to track demographic trends and to identify characteristics of births and deaths in West Virginia. This information is made available to BMS by HSC for planning, policy, and claims adjudication purposes.

The business rules developed for this model, determine whether the member is deceased before reimbursements are made to the MCO in the capitation amount; if deceased, BMS validates the date of death (DOD) with the HSC data to remove any inconsistencies in the WV Medicaid claims data. As part of this validation BMS should also compare HSC data to the federally maintained Death Master file at least once per quarter and review its current processes to ensure the HSC data is not altered or overwritten once ingested by the MMIS

West Virginia Bureau for Medical Services
And Marshall University Research Corporation
Data Analytics Pilot Program

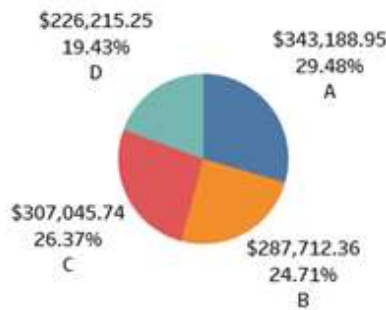
system. Please note: such overpayments can occur for a variety of reasons including inaccurate member enrollment data reporting and through member-perpetrated fraud schemes in which individuals without Medicaid coverage steal the identify of a Medicaid member and continues to receive services through their benefit plan after their death. ***The financial results achieved in applying this business rules are potentially significant with a cost avoidance of approximately \$460,000 over the three-year evaluation period.*** The following visualizations detail the results of the Capitation After Death Quick Win model. The data model results identify capitation payments by payer risk score and payments at risk distributed by payer.

Payer	Payment	Claim Count	Members
4	1,164,162	3,818	573

Outlier Summary by Payer

Payer	Payment	Claim Count	Members
A	343,189	1,126	179
B	287,712	888	123
C	307,046	1,060	160
D	226,215	744	122

Payment at Risk Distribution by Payer

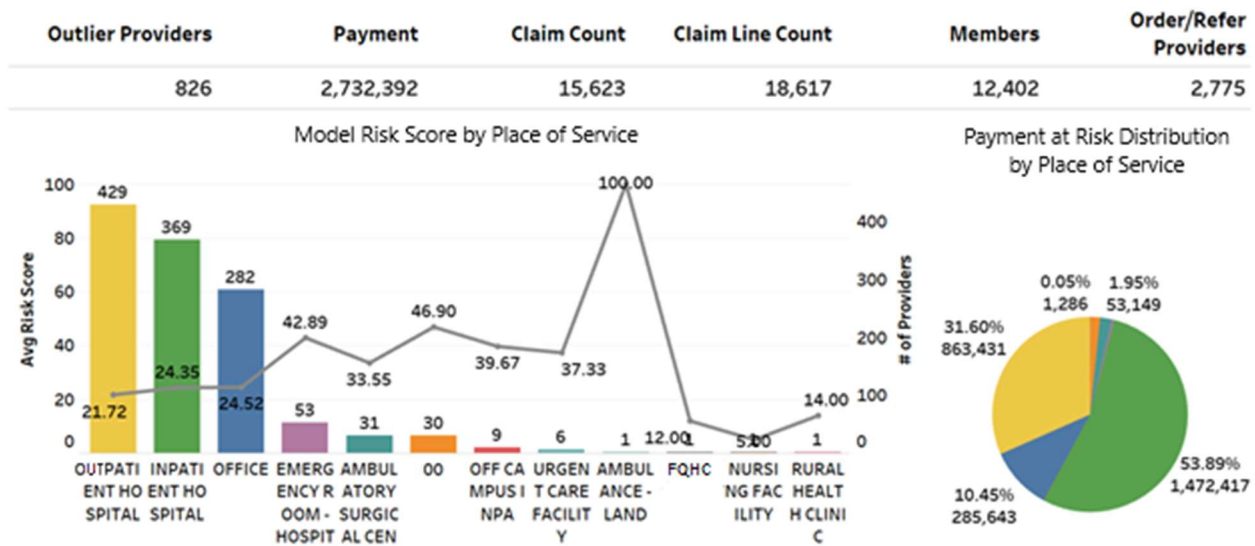


Model 08: Multiple Surgery Reduction Modifier-51:

The purpose of this model is to identify providers who fail to add the appropriate, required modifier (modifier-51) to the Medicaid claim when the member has multiple procedures performed on the same date of service. Without the modifier-51, there is high likelihood of an overpayment as the appropriate reductions in payment effectuated by this modifier are not taken from subsequent procedures performed. In addition, overpayments are possible if the provider submits multiple claims for the same date of service (DOS) and includes one procedure for each claim. In this scenario, claims adjudication business rules applied by the WV MMIS to prevent such overpayments are effectively bypassed as a direct result of the providers inappropriate billing behavior.

West Virginia Bureau for Medical Services
And Marshall University Research Corporation
Data Analytics Pilot Program

A business rule is proposed to initially deny any multiple surgery procedure claims for resubmission that did not have the modifier-51 designation. This edit to the model would identify the primary procedure and determine if other procedures on the same DOS, either on the same claim or other claims, have the correct modifier. In the case of the same claim, the entire claim would be denied for resubmission. For the claims submitted separately, the primary claim would be processed, and the subsequent claims denied for resubmission. The following visualizations detail the results of the Multiple Surgeries Reduction Quick Win model. The data results are presented by payment at risk by place of service (POS).



Model 025: Potential Improper Provider Referral Relationship:

This model identifies potential fraudulent provider behavior in the improper referring of members for ancillary services, such as kickback schemes. This model identified outlying referring provider based upon a pattern of ordering services from specific entities at a high frequency relative to other ordering providers. This model utilizes provider enrollment information, as well as claims data, to identify questionable relationships.

The business rule developed to discover this fraudulent behavior evaluates the claims that put approximately \$34M in payments at risk over a three-year WV Medicaid claims reporting period. *Evaluating that payment at risk, in conjunction with the potential fraudulent provider behavior, identifies approximately \$14M in potential cost savings and claims payment recoupment over this three-year period.* This model is designed to address fraudulent behavior, and as such, the primary potential ROI will most likely be realized in the form of fraud prosecutions of the provider(s). *Thus far, BMS has successfully referred one provider to the WV MFCU after having been identified as a high-risk provider under Model 25. Based on the results of this model BMS estimates the provider received \$91,303.84 in Medicaid Reimbursement for fraudulent claims over a 2-year period.* The following visualizations detail the results of the Potential Improper Provider Referral Relationships

West Virginia Bureau for Medical Services
And Marshall University Research Corporation
Data Analytics Pilot Program

Outlier Provider	Claim Count	Members
2,094	377,670	97,582



Quick Win Model. The data results are presented by payment at risk by place of service (POS).

Model 40: Improper Billing of Personal Care Services During Inpatient Stay:

This data model identifies providers who improperly bill for personal care services when the member is ineligible to receive these services due to being admitted at an inpatient hospital. Personal care services may be provided on the first and last day of an inpatient hospital admission only. Personal care services provided during the inpatient stay on dates other than admission and discharge would be considered duplicative of the services provided as part of the inpatient admission and an overpayment. A limitation impacting the effectiveness of this this model is the use of span billing by personal care providers, which is discussed later in section 5 of this summary report.

Personal care services (PCS) are provided to eligible member to help them maintain a self-sufficient lifestyle, rather than being subjected to an institutional setting, such as a nursing home. Since WV Medicaid plans allow date-range billing, a business rule by BMS should require Personal care service providers to bill for no more than 1 date of service on a single claim line. In addition, PCS providers should be instructed to conduct self-audits to ensure that the staff follow all internal policies and procedures which helps to identify problems early. Finally, BMS should implement a WV MMIS edit to deny claim lines for personal care services with greater than 1 date of service reported. ***If these rules are implemented, BMS will realize a three-year claims recoupment value of over \$770,000.*** The following visualizations detail the results of the Improper Billing of Personal Care Services During

Inpatient Stay Quick Win model. The data results are presented by payment at risk by place of service (POS).

Outlier Providers	Payment	Claim Count	Claim Line Count	Members
62	1,951,362	2,083	2,355	917



Section 4.0 Model Enhancements for Education, Expanded Reporting, Monitoring and Service Delivery: A Successful ROI Example

A significant value for the FWA project is the ongoing educational benefit to the WV Medicaid service providers. As the data models evolved during the FWA project, it became apparent that BMS, WV Medicaid providers, and MCO will benefit from the embedded educational capabilities of developing BMS internal procedures, workflow, and training plans to meet the requirements of the federal regulations. The training and monitoring benefits for the Medicaid provider population has been proven in other states, Utah, for example, to significantly reduce overpayments in a proactive, cost avoidant, manner and to improve the quality of service to Medicaid members.

4.1 Example: UOIG: The Utah Office of Inspector General (UOIG) is an example of a successful development and execution of a Medicaid Cost Avoidance ROI project and a model for BMS to review. The focus on the UOIG model is the potential similar outcome for WV Medicaid. The Medicaid budgeting and cost by service in the state of Utah is the lowest in the country.⁵ For the fiscal year ending 2017, CMS reported that Utah expended approximately \$2.4B on Medicaid services.⁶

4.2 The UOIG Cost Avoidance Results: Over a three-year (3) period, the UOIG measured the effect of the cost avoidance methodology. In January 2018, the end of the observation period, the UOIG found an approximate \$14M Medicaid cost avoidance for state fiscal year (SFY) 2018 and a projected \$14M cost avoidance for SFY 2019. The cost avoidance return on

West Virginia Bureau for Medical Services
And Marshall University Research Corporation
Data Analytics Pilot Program

investment (ROI) for SFY 2018 is 474% or, for every \$1 expended, Utah Medicaid avoided \$4.74 in claims not issued. The cost avoidance ROI calculation for the UOIG is (recovery amount/expenditures) x 100.⁷ The expenditure amount is calculated as an operations processing cost to the UOIG, e.g., computer processing, human resource expense, supplies, cost of funds, etc. The principle change in provider behavior during this time came from state sponsored education and training. The provider behavior was monitored to measure the Utah Medicaid claims cost avoidance.

4.3 Education: In the FWA project, the data model development focused on the utilization of existing and new analytic methods to identify anomalous claims that may reflect suspicious billing behaviors or provider relationships. These explorations, with added data and analytics, reveal during the model development several instances of questionable practices were identified that may not be representative of fraud, waste, or abuse under current policies but could be addressed through targeted provider education efforts. In developing an education program, it is recommended that a recipient-oriented perspective of service be maintained that allow the data models to isolate questionable practices by the service providers who may not appear fraudulent in conducting questionable practices based on a single analytic outcome.

4.4 Model Improvement with External Data: The data models developed through the WV FWA project produced operational results with a high degree of confidence in the actionable data. The project demonstrated conclusive outcomes to detect and report on fraudulent, wasteful, and abusive billing practices by providers enrolled in the WV Medicaid program. To expand the scope of the detection and reporting, MURC is recommending that BMS continue to incorporate and expand on the use of external data sources, similar to the use of vital statistics data in FWA Model 05, into the WV Medicaid claims dataset to further inform on outlier practices and outcomes. All data repositories can benefit from enriched datasets. Integration of additional external data sources potentially would allow BMS to work cooperatively with neighboring and similarly situated Medicaid programs on fraud, waste, and abuse outcomes that are not possible with single data analytic outcomes.

Section 5 Possible Edits and Business Rules Affecting ROI

5.1 Span Billing: During the WV FWA Project, it was determined, based on the Quick Win model results, that span billing was a significant factor inhibiting the models from identifying overlapping services and increasing the false positive rate for the impacted models. One example of this billing practice is highlighted in Model 40, which is also reviewed in the Early Successes section of this report, to identify personal care services billed during an inpatient stay. As personal care providers (in addition to other provider types) are permitted to routinely bill for spans of time, normally over the course of a month. Because such claims report a range of dates of service on a single claim line it is effectively impossible for the model to determine the number of units billed contrary to BMS policy. In such instances medical records would be needed to ascertain the precise portion of the payment which was an overpayment.

5.2 Possible Multi-Model Edits

5.2.1 Bill Spanning: In addition to the specific edits proposed in the “Early Successes” section of this summary report, a more general category of edits are possible to address multi-model conditions, like bill spanning and duplicated recipient ID numbers. In addition to the edits suggested that identify providers who improperly bill for personal care services, Model 040 could be enhanced, for example, and the edits applied to other FWA models, to potentially identify and reject claims for services spanning multiple days. The implementation of this edit would be straightforward for each date of services encompassing personal care, home health, and other similar services, with each individual claim line expected to reflect the units of service provided on the particular date of service. An edit like this has the potential to lower the false positive rate in the models and to encourage the providers to be more accountable for each date of service.

5.2.2 Duplicated Recipient Identification Numbers: The WV FWA Project was effective in identifying and proposing rules to correct duplicative capitation payments, identified in Model 05, due to duplicated recipient ID numbers in the data. The findings in Model 05 show the potential to report a significant number of erroneous payments when internal controls are not implemented and pursued in a timely manner. To remedy this situation, additional multi-model edits, like the edits in Model 05, are recommended when adding new recipients to the system. These edits would warn providers and case workers when recipients are in the system with the same SSN/DOB by running a monthly report, or developing an operational dashboard, as a value added for additional internal control.

6.0 Strategies for Continued FWA Analytic Development and Utilization: The Model Types

The model development process in the FWA Project is specifically designed to produce actionable data; a finalized analytical result that can be leveraged by BMS to improve provider policy compliance, recommend modifications to existing BMS policy, and eliminate fraud, waste, and abuse of the WV Medicaid Program. This result is based on an extensive review process, during which an iterative approach of disseminating intermediate results or requiring additional analysis before a model result is produced was utilized. During the FWA project, the iterative process was beneficial in developing full-functioning data models that accurately report on outlying provider billing behavior and represent, to a significant degree, the results of the state of WV Medicaid billing and claims processing systems and policies over the two year review period. This iterative approach can continue by using sensitivity analysis with the existing data models as new review criteria or claims processing results are identified.

6.1 Model Types: During the FWA project, different types of models were developed; in general, the standard rules-based data models (Quick Wins) were used to report on the outlier behavior and monitor the application of the WV Medicaid policy for billing and claims processing. The predictive and risk models were developed to project possible outlier results based on billing and service trends observed in the claims data. From these model results, the provider outlier

West Virginia Bureau for Medical Services
And Marshall University Research Corporation
Data Analytics Pilot Program

risk was calculated with a high degree of precision and accuracy. Additional benefits can be achieved by doing billing and service trending with the FWA predictive models as a projection of additional potential payments at risk, cost avoidance and overpayment claims recovery. With the trending data from the predictive models, BMS is positioned to conduct sensitivity analysis with the data models, which could project additional Return on Investment (ROI).

6.1.1 Predictive Modeling: Unlike the rule-based (Quick Win) models, the predictive models are developed using machine logic to categorize the types of billing and outlier claims. As a machine-driven process, the predictive models are most effective when retrained or redeveloped, with new and expanded claims data, at least once a year to produce reliable outcomes. The predictive models have the primary design objectives to help replicate the decision-making process of BMS staff and to provide new factors of analysis for the Quick Win models. Since the review criteria is subject to change as the result of changes to policy the predictive model is designed for continuous training by the data, which improves the accuracy of the prediction of pursuit likelihood over time.

The FWA project developed two predictive models based on the expert labels provided by subject matter experts within BMS. The nature of predictive modeling requires the gathering of detailed information about the overpayment pursuit and recovery process, the claim lines and the providers identified and engaged, the type of appeal activity encountered, and other descriptive elements concerning the level of effort for each required pursuit. This is the type of data that will continue to train the models for timely and accurate reporting of pursuit and recoupment activity. This extended information and training of the predictive models can be used to align and prioritize pursuit action at a “per outlier level” to enable sensitivity analysis for a more accurate estimate of a calculated ROI with more accurate levels of data sensitivity (true positive) and data specificity (true negative) outcomes.

6.1.2 Risk Model and the Composite Score: As a part of the FWA Project, a risk model, using a composite risk score, was developed as an indicator of the overall risk of the rule-based (Quick Win), predictive and referral ROI models. The desired outcome of the risk model is to define a metric that can assist in determining the priority of the recoupment pursuits and likelihood a particular provider has engaged in fraudulent behavior. As a general capability, the composite risk score is a combination and review of multiple analytic models describing the number of outlier claims within a model, the relative rank of an individual provider within a model, the number of times the outlier(s) appear in the data models, and the total dollars at risk identified on a model-by-model basis. This risk identifier is then combined across a suite of data models to identify and rank the providers. The outcome of a provider’s composite risk model score provides valuable insight into the full range of services billed by the provider and helps to determine the MCOs most affected by billing problems or member management. This score is not a comparative risk assessment based on the egregiousness of certain activities, but a ranking of providers as identified outliers and an indicator of possible pursuit opportunities.

6.1.2.1 Composite Risk Score Benefits: As a planning matrix, the composite risk score can be used in a workflow to identify a particular outlier behavior, an indicator, which may result in a high likelihood of payment return for BMS. From that indicator, the composite score can help to determine, separate from the individual model risk score, the highest priority providers for pursuit based on the likelihood of return and identify those providers most likely to have engaged in fraud, waste, or abuse through a wide variety of methods, as opposed to a single scheme. In this outlier identification, the risk model is maximizing resource utilization by reviewing additional records and activities across multiple service areas and data models that would otherwise wait until other unrelated indicators were identified and investigated.

Conclusions

The FWA project results realized through this engagement are encouraging and provide a window of opportunity for BMS to continue developing analytic capacities. Utilizing the current model results and visuals will support greatly enhanced FWA detection and pursuit in WV Medicaid. This analytical approach enables WV Medicaid to continuously monitor and/or realize essential modifications to existing policies and processes while protecting and guarding the Medicaid program against fraud, waste, and abuse.

With ongoing review and alignment with the WV Medicaid policy, BMS will realize opportunities to enhance policy and reveal non-compliance with regulations. The methods developed during this engagement support those objectives.

Endnotes:

1 Hugh P. Possingham, David B. Lindenmayer, in Encyclopedia of Biodiversity (Second Edition), 2013, accessed online from <https://www.sciencedirect.com/topics/medicine-and-dentistry/sensitivity-analysis>

2 Haiyan Huang, Multiple Hypothesis Testing and False Discovery Rate, accessed online, <https://www.stat.berkeley.edu/~hhuang/STAT141/Lecture-FDR.pdf#:~:text=Traditionally%20we%20try%20to%20set%20Type%20I%20error,so%20significance%20levels%20need%20to%20be%20chosen%20carefully>, pg. 2.

3 “Level of significance.” Merriam-Webster.com Dictionary, Merriam-Webster, <https://www.merriam-webster.com/dictionary/level%20of%20significance>. Accessed 20 Oct. 2020.

4 Ibid, 3.

5 Distribution of Medicaid spending in Utah in 2018, by service, (2018), accessed online from <https://www.statista.com/statistics/187214/distribution-of-spending-on-medicaid-services-in-utah/>

6 Analysis of CMS-64 expenditure reports for FFY 2017 from the Medicaid Budget and Expenditure System/State Children's Health Insurance Program Budget and Expenditure System (MBES/CBES), (2017), accessed online from <https://www.medicaid.gov/state-overviews/scorecard/annual-medicaid-chip-expenditures/index.html>

7 Annual Estimates of the Resident Population for the United States, Regions, States, and Puerto Rico: April 1, 2010 to July 1, 2019, (2019), accessed online from <https://www.census.gov/data/datasets/time-series/demo/popest/2010s-national-total.html>

Appendix I: Overview of Data Models

All-Payer Models																	
Model 02: Group Practice Duplicate Billing																	
Model Summary	Proposed Business Rules(s)																
<p>The purpose of this project is to identify providers who participate (servicing or rendering) in the same group practice who may treat and bill for the same member on the same date of service. WV policy does not allow the same service (generally E&M) to be billed more than one time for each date of service (DOS) unless a provider of a different specialty provides services. WV would deem this as duplicate billing. Traditional editing for potential duplicates looks for same billing, same code, same servicing and therefore modifying the structure by inputting a different servicing may allow duplicate billing and violates policy. The same criteria exist for hospital-based E&M services.</p>	<p>Business Rule 1: Training for the Providers/Nurses not to bill E&M codes for same service on the same DOS for same member more than once from the same specialty. This can also be a Sentinel event. For example, provide the training for a period, observe the physicians billing activities during that period and also track the number of claims pre and post the training to see the trend.</p> <p>Business Rule 2: Implement a logic to the claims process to check the E&M claim for any duplicates before processing the payment. The logic is to check if the billing provider had billed any other E&M claim within the CPT code range 99201 to 99499 if any claim found then check for the servicing provider on the claim. If the servicing provider is from the same specialty, then it is considered as a duplicate claim. Only process the claims if the servicing providers from both the claims are from different specialty.</p>																
Analytic Results	Cost Savings Projection																
<ul style="list-style-type: none"> • Number of outliers identified by model: 96 • Potential Short-Term ROI: \$586,969.60 • Potential Cost Avoidance ROI: \$362,199.04 	<p>Based upon the analytic results of this model, implementation of a business rule using these criteria could prevent a considerable number of inappropriate or noncompliant claims for duplicate services from being paid. The potential savings that could result from implementing these criteria both for FFS and MCO claims are detailed below:</p>																
Observations/Recommendations	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr style="background-color: #d9ead3;"> <th colspan="2" style="text-align: left;">Cost Savings Analysis</th> </tr> </thead> <tbody> <tr> <td style="text-align: right;">Total Risk (minus Error):</td> <td style="text-align: right;">\$748,398.09</td> </tr> <tr> <td style="text-align: right;">Reduction in Risk (50%):</td> <td style="text-align: right;">\$374,199.04</td> </tr> <tr> <td style="text-align: right;">Hours to Implement:</td> <td style="text-align: right;">80</td> </tr> <tr> <td style="text-align: right;">Cost of Control:</td> <td style="text-align: right;">\$12,000.00</td> </tr> <tr> <td style="text-align: right;">ROI</td> <td style="text-align: right;">30.18</td> </tr> <tr> <td colspan="2" style="text-align: right;"><i>Potential Cost Avoidance:</i></td> </tr> <tr> <td colspan="2" style="text-align: right;"><i>\$362,199.04</i></td> </tr> </tbody> </table>	Cost Savings Analysis		Total Risk (minus Error):	\$748,398.09	Reduction in Risk (50%):	\$374,199.04	Hours to Implement:	80	Cost of Control:	\$12,000.00	ROI	30.18	<i>Potential Cost Avoidance:</i>		<i>\$362,199.04</i>	
Cost Savings Analysis																	
Total Risk (minus Error):	\$748,398.09																
Reduction in Risk (50%):	\$374,199.04																
Hours to Implement:	80																
Cost of Control:	\$12,000.00																
ROI	30.18																
<i>Potential Cost Avoidance:</i>																	
<i>\$362,199.04</i>																	
<ul style="list-style-type: none"> • In many instances multiple E&M claims on a single date are appropriate, such as when the second provider to render service is of a different specialty. As a result, medical records will be needed in some cases to determine the appropriateness of the second E&M service billed. 																	

West Virginia Bureau for Medical Services
And Marshall University Research Corporation
Data Analytics Pilot Program

Model 03: New Patient Churning															
Model Summary	Proposed Business Rules(s)														
<p>The purpose of this project is to identify providers who bill new patient visits when a member changes payer organization. (FFS to MCO or MCO to different MCO) An example is member visits a provider as a member of the FFS program and the provider bills a new patient visit (99201 to 99205). Subsequently the patient changes to MCO A, visits the same provider and the provider bills for new patient E&M even though the member has been seen within the past 3 years. (A condition of the code description). Because the services are being paid from a different payer, the editing system does not identify the improper billing. Any provider who bills more than one time in a 3-year period (any one of the 5 codes 99201-99205) a new patient code is in conflict with coding practices and the subsequent code would be deemed an overpayment. Providers have available other E&M codes for routine visits from a current member. The new patient E&M codes pay at a higher reimbursement than standard E&M codes.</p>	<p>Business Rule 1: Prevent multiple New Patient bills for a member within a period of 3 years with the same provider group and specialty by implementing the following business rule to determine whether a member see another provider from the same specialty within same group</p> <ol style="list-style-type: none"> 1- Check the date of the new patient E&M claim if within 3 years compared to the initial claim then 2- check if Same billing provider then 3- check if Same Department then 4- check if Same specialty of servicing provider <p>In the case above this visit cannot be a new patient visit so the claim should be denied.</p>														
Analytic Results	Cost Savings Projection														
<ul style="list-style-type: none"> • Number of outliers identified by model: 340 • Potential Short-Term ROI: \$262,624.00 • Potential Cost Avoidance ROI: \$391,337.35 	<p>Based upon the analytic results of this model, implementation of a business rule using these criteria could Prevent multiple New Patient bills for a member within a period of 3 years with the same provider group and specialty. The potential savings that could result from implementing these criteria both for FFS and MCO claims are detailed below:</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="2" style="background-color: #d9ead3;">Cost Savings Analysis</th> </tr> </thead> <tbody> <tr> <td>Total Risk (minus Error):</td> <td style="text-align: right;">\$806,674.70</td> </tr> <tr> <td>Reduction in Risk (50%):</td> <td style="text-align: right;">\$403,337.35</td> </tr> <tr> <td>Hours to Implement:</td> <td style="text-align: right;">80</td> </tr> <tr> <td>Cost of Control:</td> <td style="text-align: right;">\$12,000.00</td> </tr> <tr> <td style="text-align: right;">ROI</td> <td style="text-align: right;">32.61</td> </tr> <tr> <td><i>Potential Cost Avoidance:</i></td> <td style="text-align: right;"><i>\$391,337.35</i></td> </tr> </tbody> </table>	Cost Savings Analysis		Total Risk (minus Error):	\$806,674.70	Reduction in Risk (50%):	\$403,337.35	Hours to Implement:	80	Cost of Control:	\$12,000.00	ROI	32.61	<i>Potential Cost Avoidance:</i>	<i>\$391,337.35</i>
Cost Savings Analysis															
Total Risk (minus Error):	\$806,674.70														
Reduction in Risk (50%):	\$403,337.35														
Hours to Implement:	80														
Cost of Control:	\$12,000.00														
ROI	32.61														
<i>Potential Cost Avoidance:</i>	<i>\$391,337.35</i>														
Observations/Recommendations															
<ul style="list-style-type: none"> • Some E&M services specifically with proc code 99201-99205 have group provider NPIs listed as servicing/rendering providers, instead pf the individual physician NPI. If group provider NPI were listed as servicing provider, there is no way to tell the actual servicing physician and their specialty. While the observed is mostly MCO data, there are few FFS data. • Providers seem to be billing inappropriately within the same payer as well as across multiple payers. Appears most of the issues have occurred within the same payer network and not between MCO payers and FFS. • Develop system editing for FFS to identify improper billing within the 3-year period. 															

West Virginia Bureau for Medical Services
And Marshall University Research Corporation
Data Analytics Pilot Program

Recommend MCO payers do the same. Additional encounter editing could be developed to identify outlier claims as they occur and could be rejected back to the applicable payer for correction.															
Model 04: Encounter Strings															
Model Summary	Proposed Business Rules(s)														
The purpose of this project is to identify providers who have significant numbers of member encounters. The goal of this project is to identify providers who may request the member to return for additional, potentially unnecessary visits multiple times in a short span. For example, return to a provider 3 days in the same week when in theory all services may have been performed in a single visit. This significantly reimburses the provider reimbursement by “stringing” the services out across multiple visits.	Business Rule 1: Identify claims where providers see the patient for the same encounter purpose (dental, behavioral health, medical) more than 5 times in the same month. This should be identified as a pattern in the analysis over time with a set percentage of patients.														
Analytic Results	Cost Savings Projection														
<ul style="list-style-type: none"> • Number of outliers identified by model: 84 • Potential Long-Term ROI: \$1,239,420.86 • Potential Cost Avoidance ROI: \$3,038,552.16 	<p>Based upon the analytic results of this model, implementation of a business rule using these criteria could Prevent multiple clinical visits for Patients within a short time period. The potential savings that could result from implementing these criteria both for FFS and MCO claims are detailed below:</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="2" style="background-color: #d9ead3;">Cost Savings Analysis</th> </tr> </thead> <tbody> <tr> <td style="padding: 2px;">Total Risk (minus Error):</td> <td style="text-align: right; padding: 2px;">\$6,197,104.</td> </tr> <tr> <td style="padding: 2px;">Reduction in Risk (50%):</td> <td style="text-align: right; padding: 2px;">\$3,098,552.</td> </tr> <tr> <td style="padding: 2px;">Hours to Implement:</td> <td style="text-align: right; padding: 2px;">400</td> </tr> <tr> <td style="padding: 2px;">Cost of Control:</td> <td style="text-align: right; padding: 2px;">\$60,000.00</td> </tr> <tr> <td style="padding: 2px;">ROI</td> <td style="text-align: right; padding: 2px;">50.64</td> </tr> <tr> <td style="padding: 2px;"><i>Potential Cost Avoidance</i></td> <td style="text-align: right; padding: 2px;"><i>\$3,038,552.</i></td> </tr> </tbody> </table>	Cost Savings Analysis		Total Risk (minus Error):	\$6,197,104.	Reduction in Risk (50%):	\$3,098,552.	Hours to Implement:	400	Cost of Control:	\$60,000.00	ROI	50.64	<i>Potential Cost Avoidance</i>	<i>\$3,038,552.</i>
Cost Savings Analysis															
Total Risk (minus Error):		\$6,197,104.													
Reduction in Risk (50%):	\$3,098,552.														
Hours to Implement:	400														
Cost of Control:	\$60,000.00														
ROI	50.64														
<i>Potential Cost Avoidance</i>	<i>\$3,038,552.</i>														
Observations/Recommendations															
<ul style="list-style-type: none"> • Many members are visiting providers 5 or more times in a single month for regular medical visits. This may warrant further review and consideration for care coordination or alternative care considerations. As for current Medicaid policy, there is no restriction on the frequency at which providers require members to attend face-to-face visits multiple times in short span. • Develop policy regarding frequency of visits during a specific time frame. For members who exceed this threshold may consider requiring prior authorization to determine medical necessity or alternative care approaches. 															
Model 07: Improper Place of Service Coding															
Model Summary	Proposed Business Rules(s)														
The purpose of this project is to identify providers who improperly code place of service on claims, which are facility based as office based thereby increasing reimbursement for their office overhead costs as allowed by payers. Identification of these claims occur by	Business Rule 1: The proposed edit would match ASC claims by physician NPI to non-facility claims, as in the algorithm, for the same types of services/beneficiaries/day.														

West Virginia Bureau for Medical Services
And Marshall University Research Corporation
Data Analytics Pilot Program

<p>matching ambulatory surgery center (ASC) claims to non-facility (office based) claims for the same types of services provided to the same beneficiaries on the same day. Physicians may have furnished these services to ASC patients at these locations instead of the coded office setting.</p>																	
<p>Analytic Results</p>	<p>Cost Savings Projection</p>																
<ul style="list-style-type: none"> • Number of outliers identified by model: 116 • Potential Short-Term ROI: \$59,488.30 • Potential Cost Avoidance ROI: \$11,795.32 	<p>Analysis indicates that implementation of this business rule criteria could prevent a considerable number of inappropriate or noncompliant claims from being paid or allow them to be recovered. The potential savings that could be realized by utilizing this edit are:</p>																
<p>Observations/Recommendations</p>	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr style="background-color: #d9ead3;"> <th colspan="2" style="text-align: left; padding: 5px;">Cost Savings Analysis</th> </tr> </thead> <tbody> <tr> <td style="padding: 5px;">Total Risk (minus Error):</td> <td style="text-align: right; padding: 5px;">\$47,590.64</td> </tr> <tr> <td style="padding: 5px;">Reduction in Risk (50%):</td> <td style="text-align: right; padding: 5px;">\$23,795.32</td> </tr> <tr> <td style="padding: 5px;">Hours to Implement:</td> <td style="text-align: right; padding: 5px;">80</td> </tr> <tr> <td style="padding: 5px;">Cost of Control:</td> <td style="text-align: right; padding: 5px;">\$12,000.00</td> </tr> <tr> <td style="padding: 5px;">ROI</td> <td style="text-align: right; padding: 5px;">0.98</td> </tr> <tr> <td colspan="2" style="padding: 5px;"><i>Potential Cost Avoidance:</i></td> </tr> <tr> <td colspan="2" style="text-align: right; padding: 5px;">\$11,795.32</td> </tr> </tbody> </table>	Cost Savings Analysis		Total Risk (minus Error):	\$47,590.64	Reduction in Risk (50%):	\$23,795.32	Hours to Implement:	80	Cost of Control:	\$12,000.00	ROI	0.98	<i>Potential Cost Avoidance:</i>		\$11,795.32	
Cost Savings Analysis																	
Total Risk (minus Error):	\$47,590.64																
Reduction in Risk (50%):	\$23,795.32																
Hours to Implement:	80																
Cost of Control:	\$12,000.00																
ROI	0.98																
<i>Potential Cost Avoidance:</i>																	
\$11,795.32																	
<ul style="list-style-type: none"> • Variance across payers may be indicative of inconsistent application of the billing policy. 																	
<p>Model 08: Multiple Surgery Reduction Modifier-51</p>																	
<p>Model Summary</p>	<p>Proposed Business Rules(s)</p>																
<p>The purpose of this project is to identify providers who neglect to input the appropriate modifier-51 when multiple procedures are performed on the same date of service. According to CPT, when multiple procedures are performed at the same session by the same provider, you may identify the additional procedure(s) or service(s) by appending modifier-51. Improper coding or editing may result in overpayments as the appropriate reduction for the second and subsequent procedures are not identified. This could further be identified if the provider submits multiple claims for the same DOS and includes one procedure on each claim and would therefore bypass any system editing that may be in place.</p>	<p>Business Rule 1: The proposed edit would flag the primary procedure and determine if any other procedures on the same DOS (either on the same claim or other claims, for the same patient thus capturing active fraud) have the correct modifier. In the case of the same claim, the entire claim would be denied for resubmission. Where the claims were submitted separately, the primary claim would be processed, and the subsequent claims denied for resubmission.</p>																

West Virginia Bureau for Medical Services
And Marshall University Research Corporation
Data Analytics Pilot Program

Analytic Results	Cost Savings Projection														
<ul style="list-style-type: none"> • Number of outliers identified by model: 887 • Potential Short-Term ROI: \$546,478.36 • Potential Cost Avoidance ROI: \$1,080,967 	<p>Analysis indicates that implementation of this business rule criteria could prevent a considerable number of inappropriate or noncompliant claims from being paid or allow them to be recovered. The potential savings that could be realized by utilizing this edit are:</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="2" style="background-color: #d9ead3;">Cost Savings Analysis</th> </tr> </thead> <tbody> <tr> <td style="padding: 2px;">Total Risk (minus Error):</td> <td style="text-align: right; padding: 2px;">\$2,185,913.43</td> </tr> <tr> <td style="padding: 2px;">Reduction in Risk (50%):</td> <td style="text-align: right; padding: 2px;">\$1,092,956.72</td> </tr> <tr> <td style="padding: 2px;">Hours. to Implement:</td> <td style="text-align: right; padding: 2px;">80</td> </tr> <tr> <td style="padding: 2px;">Cost of Control:</td> <td style="text-align: right; padding: 2px;">\$12,000.00</td> </tr> <tr> <td style="padding: 2px;">ROI</td> <td style="text-align: right; padding: 2px;">90.08</td> </tr> <tr> <td colspan="2" style="padding: 2px;"><i>Potential Cost Avoidance:</i> \$1,080,956.72</td> </tr> </tbody> </table>	Cost Savings Analysis		Total Risk (minus Error):	\$2,185,913.43	Reduction in Risk (50%):	\$1,092,956.72	Hours. to Implement:	80	Cost of Control:	\$12,000.00	ROI	90.08	<i>Potential Cost Avoidance:</i> \$1,080,956.72	
Cost Savings Analysis															
Total Risk (minus Error):		\$2,185,913.43													
Reduction in Risk (50%):	\$1,092,956.72														
Hours. to Implement:	80														
Cost of Control:	\$12,000.00														
ROI	90.08														
<i>Potential Cost Avoidance:</i> \$1,080,956.72															
Observations/Recommendations															
<ul style="list-style-type: none"> • Variance across payers may be indicative of inconsistent application of billing modifier (51) when multiple procedures are performed on the same date of services. • Because outliers identified by this model are not likely to result in recovery of the full payment the short-term ROI assumes that resolution of overpayments identified by this model will result in an average total payment reduction of 25%. 															
Model 09- Global surgery improper billing															
Model Summary	Proposed Business Rules(s)														
<p>The purpose is to identify providers who “unbundle” or bill additional services that should be included in the global surgery fee based on the global surgical period(10, 60, 90 days).</p>	<p>Business Rule 1:</p> <ol style="list-style-type: none"> 1. Top 10 procedure codes based on the number of outlier claims: 99232, NULL, 99233, 99213, 99214, 36415, 93010, 99231, 99291, 99283. 2. Top 10 modifiers based on the number of outlier claims: Null, GC, RT, LT, 25, 26, 24, GP, 59, 58. 3. Flag those claims for these codes to check if there is surgery claim for the same patient with the same provider within 10, 60 or 90 days. If yes, then the code should be included in the global surgery fee and should not be paid as an individual claim. 4. Have a registry or a dashboard for all the surgery patients and track their claims for 90 days after their surgery. Identify the claims that were not handled by the DXE edit and determine if they need to bundle. 5. Services included: Complications with same or different diagnosis related to the surgery, transfer to another physician/facility only with acceptance letter or an annotation in the discharge summary, hospital record, or ASC record. 														

West Virginia Bureau for Medical Services
And Marshall University Research Corporation
Data Analytics Pilot Program

Analytic Results	Cost Savings Projection														
<ul style="list-style-type: none"> • Number of outliers identified by model: 1044 • Potential Short-Term ROI: \$3,851,374.69 • Potential Cost Avoidance ROI: \$8,878,436.72 	<p>Based upon the analytic results of this model implementation of this business rule criteria would prevent a considerable number of inappropriate or noncompliant claims for anesthesia services from being paid. The potential savings that could be realized by utilizing this edit both for FFS and MCO claims are detailed below:</p>														
<p>Observations/Recommendations</p> <ul style="list-style-type: none"> • Given the ways in which modifiers can impact payment of these claims, medical records will be needed in all or nearly all cases. Several providers are utilizing Mod 25 potentially in an effort to bypass NCCI requirements. • Recommend education regarding proper billing of global surgical packages. Identify most aberrant providers and watch for improvement in billing practices especially those who utilize 25 without proper documentation. If improvements do not occur after notification, may consider MFCU referral if BMS criteria is met. 															
<table border="1"> <thead> <tr> <th colspan="2" data-bbox="815 590 1427 632">Cost Savings Analysis</th> </tr> </thead> <tbody> <tr> <td data-bbox="815 632 1182 674">Total Risk (minus Error):</td> <td data-bbox="1182 632 1427 674">\$19,256,873.44</td> </tr> <tr> <td data-bbox="815 674 1182 716">Reduction in Risk (50%):</td> <td data-bbox="1182 674 1427 716">\$9,628,436.72</td> </tr> <tr> <td data-bbox="815 716 1182 758">Hours to Implement:</td> <td data-bbox="1182 716 1427 758">5000</td> </tr> <tr> <td data-bbox="815 758 1182 800">Cost of Control:</td> <td data-bbox="1182 758 1427 800">\$750,000.00</td> </tr> <tr> <td data-bbox="815 800 1182 842">ROI</td> <td data-bbox="1182 800 1427 842">11.84</td> </tr> <tr> <td data-bbox="815 842 1182 911"><i>Potential Cost Avoidance:</i></td> <td data-bbox="1182 842 1427 911"><i>\$8,878,436.72</i></td> </tr> </tbody> </table>		Cost Savings Analysis		Total Risk (minus Error):	\$19,256,873.44	Reduction in Risk (50%):	\$9,628,436.72	Hours to Implement:	5000	Cost of Control:	\$750,000.00	ROI	11.84	<i>Potential Cost Avoidance:</i>	<i>\$8,878,436.72</i>
Cost Savings Analysis															
Total Risk (minus Error):	\$19,256,873.44														
Reduction in Risk (50%):	\$9,628,436.72														
Hours to Implement:	5000														
Cost of Control:	\$750,000.00														
ROI	11.84														
<i>Potential Cost Avoidance:</i>	<i>\$8,878,436.72</i>														
Model 10: Critical Care Services on Discharge Date															
Model Summary	Proposed Business Rules(s)														
<p>The purpose of this project is to identify providers who bill for critical care services on the same date of discharge from an inpatient facility. From a medical necessity perspective, one would not believe someone who received critical care services would be well enough to be discharged on the same day critical care services were performed.</p>	<p>Business Rule 1: Targeted Training for providers/billers to clarify that critical care services cannot be billed on the same date of discharge from an inpatient facility. This can be a Sentinel event while implementing the Business rule.</p> <p>Business Rule 2: Before processing any Critical care, service claim has a condition to check for a discharge claim from an inpatient facility for the same member on the same DOS from the same provider. If any claims found do not process the critical care service claim.</p>														
Analytic Results	Cost Savings Projection														
<ul style="list-style-type: none"> • Number of outliers identified by model: 74 • Potential Long-Term ROI: \$41,989.60 • Potential Cost Avoidance ROI: \$11,249.73 	<p>Based upon the analytic results of this model, implementation of a business rule using these criteria could prevent a considerable number of inappropriate or noncompliant claims for anesthesia services from being paid. The potential savings that could result from implementing these criteria both for FFS and MCO claims are detailed below:</p>														
<p>Observations/Recommendations</p> <ul style="list-style-type: none"> • Looking at the subsequent hospital bill when the patient transfers to a different hospital provides more information. • Given low dollars per provider likely this will be deemed improper billing based upon administrative error. • Provide education and recoup from the top billing providers. The highest error for a provider for the review period is just over 13k 															

West Virginia Bureau for Medical Services
And Marshall University Research Corporation
Data Analytics Pilot Program

<p>so likely not high enough for fraud referral. If, however, after education this behavior still exists, may wish to revisit. May wish to ask remaining providers to conduct a self-audit in addition to education for awareness.</p>	<table border="1"> <thead> <tr> <th colspan="2">Cost Savings Analysis</th> </tr> </thead> <tbody> <tr> <td>Total Risk (minus Error):</td> <td>\$46,499.46</td> </tr> <tr> <td>Reduction in Risk (50%):</td> <td>\$23,249.73</td> </tr> <tr> <td>Hours to Implement:</td> <td>80</td> </tr> <tr> <td>Cost of Control:</td> <td>\$12,000.00</td> </tr> <tr> <td>ROI</td> <td>0.94</td> </tr> <tr> <td colspan="2"><i>Potential Cost Avoidance: \$11,249.73</i></td> </tr> </tbody> </table>	Cost Savings Analysis		Total Risk (minus Error):	\$46,499.46	Reduction in Risk (50%):	\$23,249.73	Hours to Implement:	80	Cost of Control:	\$12,000.00	ROI	0.94	<i>Potential Cost Avoidance: \$11,249.73</i>	
Cost Savings Analysis															
Total Risk (minus Error):	\$46,499.46														
Reduction in Risk (50%):	\$23,249.73														
Hours to Implement:	80														
Cost of Control:	\$12,000.00														
ROI	0.94														
<i>Potential Cost Avoidance: \$11,249.73</i>															
Model 11- Ambulance Transportation Billed During Hospice Election															
Model Summary	Proposed Business Rules(s)														
<p>The purpose of this project is to identify providers who bill for ambulance transportation services while the member is in Hospice.</p>	<p>Business Rule 1: Deny ambulance PX codes ('A0425', 'A0426', 'A0427', 'A0428', 'A0429', 'A0432', 'A0433', 'A0434') based on date of service where an active hospice code ('0651', '0652', '0653', '0654', '0655', '0656', '0657', '0658') is present.</p>														
Analytic Results	Cost Savings Projection														
<ul style="list-style-type: none"> • Number of outliers identified by model: 31 • Potential Short-Term ROI: \$66,010.40 • Potential Cost Avoidance: \$55,317.41 	<p>Based upon the analytic results of this model implementation of this business rule criteria would prevent a considerable number of inappropriate or noncompliant claims for anesthesia services from being paid. The potential savings that could be realized by utilizing this edit both for FFS and MCO claims are detailed below:</p>														
Observations/Recommendations	<table border="1"> <thead> <tr> <th colspan="2">Cost Savings Analysis</th> </tr> </thead> <tbody> <tr> <td>Total Risk (minus Error):</td> <td>\$122,634.82</td> </tr> <tr> <td>Reduction in Risk (50%):</td> <td>\$61,317.41</td> </tr> <tr> <td>Hours to Implement:</td> <td>40</td> </tr> <tr> <td>Cost of Control:</td> <td>\$6,000.00</td> </tr> <tr> <td>ROI</td> <td>9.22</td> </tr> <tr> <td colspan="2"><i>Potential Cost Avoidance: \$55,317.41</i></td> </tr> </tbody> </table>	Cost Savings Analysis		Total Risk (minus Error):	\$122,634.82	Reduction in Risk (50%):	\$61,317.41	Hours to Implement:	40	Cost of Control:	\$6,000.00	ROI	9.22	<i>Potential Cost Avoidance: \$55,317.41</i>	
Cost Savings Analysis															
Total Risk (minus Error):	\$122,634.82														
Reduction in Risk (50%):	\$61,317.41														
Hours to Implement:	40														
Cost of Control:	\$6,000.00														
ROI	9.22														
<i>Potential Cost Avoidance: \$55,317.41</i>															
<ul style="list-style-type: none"> • The likelihood of recovering from providers identified by this model is high without the need for additional medical but records may be needed in some instances to confirm the member's hospice election period. 															
Model 13: Hospital Readmission 30 days or Less															
Model Summary	Proposed Business Rules(s)														
<p>The purpose of this project is to identify providers who may inappropriately bill for hospital readmissions within 30 days or less. When hospitals are reimbursed based on DRG groups and a member is readmitted to the hospital for the same or similar diagnosis both claims should be reviewed to determine if the DRGS should be combined into a single payment or paid individually. If DRG should have been combined the individually paid DRG</p>	<p>Business Rule 1: Prior authorization requirements should be implemented to determine the appropriateness of the second admission and whether the reimbursement should be combined rather than paid separately. Including any readmission and not just for the same hospital as hospitals in the WV area are part of the same group and therefore could bill under different provider numbers, NPIs when in fact they are part of the same hospital groups.</p>														

West Virginia Bureau for Medical Services
And Marshall University Research Corporation
Data Analytics Pilot Program

may be deemed an overpayment may exist.													
Analytic Results	Cost Savings Projection												
<ul style="list-style-type: none"> • Number of outliers identified by model: 121 • Potential Short-Term ROI: \$3,143,339.34 • Potential Cost Avoidance: \$12,213,357.37 	<p>Based upon the analytic results of this model, implementation of a business rule using these criteria could determine whether DRG should be combined into a single payment or paid individually. The potential savings that could result from implementing these criteria both for FFS and MCO claims are detailed below:</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr style="background-color: #d9ead3;"> <th colspan="2" style="text-align: left;">Cost Savings Analysis</th> </tr> </thead> <tbody> <tr> <td style="padding: 2px;">Total Risk (minus Error):</td> <td style="text-align: right; padding: 2px;">\$25,146,714.74</td> </tr> <tr> <td style="padding: 2px;">Reduction in Risk (50%):</td> <td style="text-align: right; padding: 2px;">\$12,573,357.37</td> </tr> <tr> <td style="padding: 2px;">Hours to Implement:</td> <td style="text-align: right; padding: 2px;">2400</td> </tr> <tr> <td style="padding: 2px;">Cost of Control:</td> <td style="text-align: right; padding: 2px;">\$360,000.00</td> </tr> <tr> <td style="padding: 2px;">ROI</td> <td style="text-align: right; padding: 2px;">33.93</td> </tr> </tbody> </table> <p><i>Potential Cost Avoidance: \$12,213,357.00</i></p>	Cost Savings Analysis		Total Risk (minus Error):	\$25,146,714.74	Reduction in Risk (50%):	\$12,573,357.37	Hours to Implement:	2400	Cost of Control:	\$360,000.00	ROI	33.93
Cost Savings Analysis													
Total Risk (minus Error):		\$25,146,714.74											
Reduction in Risk (50%):	\$12,573,357.37												
Hours to Implement:	2400												
Cost of Control:	\$360,000.00												
ROI	33.93												
Observations/Recommendations													
<ul style="list-style-type: none"> • Data integrity issue with admit and discharge dates referenced in narrative recommendations document and discussed multiple times throughout the engagement. Qlarant implemented a workaround due to multiple discharge dates for what could be the same admission. • Explore all hospital admissions where this overlap may occur. This could be accomplished by identifying the same admit date with multiple discharge dates. • We expect that some portion of the readmissions in quick succession identified by this model will be found to be appropriate upon reviewing medical records. 													
Model 14: MCO and FFS Services on the Same Date													
Model Summary	Proposed Business Rules(s)												
<p>The purpose of this project is to identify providers who may inappropriately bill for both FFS and managed care services on the same date of service. There are instances where services should not be unbundled as the service was performed on the same date. However, due to carve outs certain codes will pay by FFS while others would be billed to and paid by the MCO. A review of such services may indicate providers who are potentially unbundling or billing inappropriately for services that would otherwise be bundled. The state would review and determine the appropriateness and collection methodology for identified overpayments.</p>	<p>Business Rule 1: Provide targeted training to providers/billers on the billing requirements for specific bundled codes based upon their prior inappropriate billing practices.</p>												

West Virginia Bureau for Medical Services
And Marshall University Research Corporation
Data Analytics Pilot Program

Analytic Results	Cost Savings Projection
<ul style="list-style-type: none"> • Number of outliers identified by model: 482 • Potential Short-Term ROI: \$516,206.21 • Potential Cost Avoidance: \$2,467,651.82 	<p>Based upon the analytic results of this model, implementation of a business rule using these criteria could prevent a considerable number of inappropriate or noncompliant claims for unbundled services from being paid. The potential savings that could result from implementing these criteria both for FFS and MCO claims are detailed below:</p>
<p>Observations/Recommendations</p>	
<ul style="list-style-type: none"> • After providing education to outlying providers Conduct an audit of the provider who received education One year after the training period is complete to identify any continuing to bill inappropriately. Providers who continued to bill inappropriately after receiving education would be considered very suspicious and would likely result in a fraud referral to the MFCU. 	
<p>Cost Savings Analysis</p>	
<p>Total Risk (minus Error): \$4,959,303.63</p>	
<p>Reduction in Risk (50%): \$2,479,651.82</p>	
<p>Hours to Implement: 80</p>	
<p>Cost of Control: \$12,000.00</p>	
<p>ROI 205.64</p>	
<p>Potential Cost Avoidance: \$2,467,651.82</p>	
<p>Model 15: Improper Billing of Global, Technical, and Professional Component Codes</p>	
Model Summary	Proposed Business Rules(s)
<p>The purpose of the model is to identify member claims where providers billed a global code in addition to either or both a technical component and a professional component.</p>	<p>Business Rule 1: Implement an edit that denies claim where the global code (no modifier) and one or both TC and 26 are billed on the same date of service and notify the biller. Alternatively, one could pay the global and deny the TC/26 if the dates of service are the same. If the state receives TC/26 claim prior to the global claim, then do not process the TC/26 claim until you receive a global claim for that service. If the claim is submitted with the modifier then deny the claim.</p> <p>Business Rule 2: While an edit can be implemented, educating the coders and providers on proper billing could help to reduce the number of errant claims and increase speed and accuracy of provider payment.</p>

West Virginia Bureau for Medical Services
And Marshall University Research Corporation
Data Analytics Pilot Program

Analytic Results	Cost Savings Projection
<ul style="list-style-type: none"> • Number of outliers identified by model: 175 • Potential Short-Term ROI: \$6,205,325.26 • Potential Cost Avoidance: \$15,282,313.14 	<p>Based upon the analytic results of this model implementation of this business rule criteria would prevent a considerable number of inappropriate or noncompliant claims for anesthesia services from being paid. The potential savings that could be realized by utilizing this edit both for FFS and MCO claims are detailed below:</p>
<p>Observations/Recommendations</p> <ul style="list-style-type: none"> • The State has indicated this particular model was one the MCOs have also audited. This model includes all claims that meet criteria as there was no avenue available to de-conflict those claims which were previously audited by the MCOs. Caution overstatement of ROI for this model. Observation also includes high number of low dollar providers identified with only 22 of 1455 providers having at risk dollars of 1000 or greater. • The likelihood of recovery from providers identified by this model is fairly high, however, medical records may be needed when outlier-reference pairs identify distinct pay-to providers. This model is difficult to develop edits for due to the timing of claim submissions. Suggest revisiting after some experience with model and results. 	
Model 23: Telehealth Questionable Billing	
Model Summary	Proposed Business Rules(s)
<p>The purpose of this project is to identify providers who are incorrectly coding and billing for telemedicine services. Any telemedicine service being offered should include a CPT code of Q3014 as the originating site. Additionally services being received (distant site) should be coded in any one of three ways: Place of Service =2; Modifier GT or 95. This project will identify all CPT codes with an originating site billing Q3014 and all other services provided to the member on the same date of service. The goal is to identify appropriate billing and that a service was received at the distant site and billed appropriately. Additionally, by including all services for the SDOS in the results the model will identify potential duplicative billing for the services as both the originating and the distant site billed and were paid for the services. Conversely, improper billing may also be reflected if a modifier GT or 95 exists on billing without the Q3014 this may also indicate</p>	<p>Business Rule 1: While education is paramount, it is recommended that an edit be built to initially deny these claims for resubmission. When denying, an explanation should be sent to the provider. The proposed edit will identify all CPT codes with an originating site billing Q3014 and beneficiaries/day.</p>

Cost Savings Analysis	
Total Risk (minus Error):	\$31,026,626.29
Reduction in Risk (50%):	\$15,513,313.14
Hours to Implement:	1540
Cost of Control:	\$231,000.00
ROI	66.16

Potential Cost Avoidance: \$15,282,313.14

West Virginia Bureau for Medical Services
And Marshall University Research Corporation
Data Analytics Pilot Program

improper billing and result in multiple services at two locations for the same issue.															
Analytic Results	Cost Savings Projection														
<ul style="list-style-type: none"> • Number of outliers identified by model: 280 • Potential Short-Term ROI: \$759,081.98 • Potential Cost Avoidance: \$291,632.79 	<p>Analysis indicates that implementation of this business rule criteria could prevent a considerable number of inappropriate or noncompliant claims from being paid or allow them to be recovered. The potential savings that could be realized by utilizing this edit are:</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr style="background-color: #d9ead3;"> <th colspan="2" style="text-align: center;">Cost Savings Analysis</th> </tr> </thead> <tbody> <tr> <td style="text-align: right;">Total Risk (minus Error):</td> <td style="text-align: right;">\$607,265.58</td> </tr> <tr> <td style="text-align: right;">Reduction in Risk (50%):</td> <td style="text-align: right;">\$303,632.79</td> </tr> <tr> <td style="text-align: right;">Hours to Implement:</td> <td style="text-align: right;">80</td> </tr> <tr> <td style="text-align: right;">Cost of Control:</td> <td style="text-align: right;">\$12,000.00</td> </tr> <tr> <td style="text-align: right;">ROI</td> <td style="text-align: right;">24.30</td> </tr> <tr> <td colspan="2" style="text-align: right;"><i>Potential Cost Avoidance:</i> \$291,632.79</td> </tr> </tbody> </table>	Cost Savings Analysis		Total Risk (minus Error):	\$607,265.58	Reduction in Risk (50%):	\$303,632.79	Hours to Implement:	80	Cost of Control:	\$12,000.00	ROI	24.30	<i>Potential Cost Avoidance:</i> \$291,632.79	
Cost Savings Analysis															
Total Risk (minus Error):	\$607,265.58														
Reduction in Risk (50%):	\$303,632.79														
Hours to Implement:	80														
Cost of Control:	\$12,000.00														
ROI	24.30														
<i>Potential Cost Avoidance:</i> \$291,632.79															
Observations/Recommendations															
<ul style="list-style-type: none"> • Variance across payers may be indicative of inconsistent application of the billing policy. 															
Model 25: Potential Improper Provider Referral Relationships															
Model Summary	Proposed Business Rules(s)														
<p>The purpose of this project is to identify providers who potentially improperly refer members to additional services where the provider may financially benefit from referring members for ancillary services. The referring provider may have ownership in additional provider entities to which he/she routinely refers. This project will utilize provider enrollment information as well as claims data to identify these questionable relationships. The purpose of this model is to identify potential fraud instead of traditional recoupment opportunities. This model requires data asset of provider enrollment information of owner/officer, etc.</p>	<p>Business Rule 1: Identify within the MMIS system any claim paid to a provider for a service ordered by an entity in which the servicing provider has an ownership interest. Such claims should be reported to BMS when a provider bills 3 or more claims meeting this criterion within a 30-day period.</p>														

West Virginia Bureau for Medical Services
And Marshall University Research Corporation
Data Analytics Pilot Program

Analytic Results	Cost Savings Projection														
<ul style="list-style-type: none"> • Number of outliers identified by model: 2095 • Potential Long-Term ROI: 1,452,394.75 • Potential Cost Avoidance: \$2,856,789.50 • Credible allegations of fraud: 2 • Fraud Referrals Accepted by MFCU: 1 	<p>Based upon the analytic results of this model, implementation of a business rule using these criteria could detect potential improper provider referral relationships. The potential savings that could result from implementing these criteria both for FFS and MCO claims are detailed below:</p>														
<p>Observations/Recommendations</p>															
<ul style="list-style-type: none"> • We observe that in some rural areas there is only few specialist providers and facilities like labs and radiology, which leads to frequent referrals, which cannot be avoided and will most likely not result in a recovery upon being reviewed and found to be appropriate. 	<table border="1"> <thead> <tr> <th colspan="2" data-bbox="823 552 1419 594">Cost Savings Analysis</th> </tr> </thead> <tbody> <tr> <td data-bbox="823 594 1182 632">Total Risk (minus Error):</td> <td data-bbox="1182 594 1419 632">\$29,047,895.06</td> </tr> <tr> <td data-bbox="823 632 1182 669">Reduction in Risk (10%):</td> <td data-bbox="1182 632 1419 669">\$2,904,789.50</td> </tr> <tr> <td data-bbox="823 669 1182 707">Hours to Implement:</td> <td data-bbox="1182 669 1419 707">320</td> </tr> <tr> <td data-bbox="823 707 1182 745">Cost of Control:</td> <td data-bbox="1182 707 1419 745">\$48,000.00</td> </tr> <tr> <td data-bbox="823 745 1182 783">ROI</td> <td data-bbox="1182 745 1419 783">59.52</td> </tr> <tr> <td colspan="2" data-bbox="823 783 1419 821"><i>Potential Cost Avoidance: \$2,856,789.50</i></td> </tr> </tbody> </table>	Cost Savings Analysis		Total Risk (minus Error):	\$29,047,895.06	Reduction in Risk (10%):	\$2,904,789.50	Hours to Implement:	320	Cost of Control:	\$48,000.00	ROI	59.52	<i>Potential Cost Avoidance: \$2,856,789.50</i>	
Cost Savings Analysis															
Total Risk (minus Error):	\$29,047,895.06														
Reduction in Risk (10%):	\$2,904,789.50														
Hours to Implement:	320														
Cost of Control:	\$48,000.00														
ROI	59.52														
<i>Potential Cost Avoidance: \$2,856,789.50</i>															
Model 26: Hospital – DRG Outlier Analysis															
Model Summary	Proposed Business Rules(s)														
<p>The purpose of this project is to identify hospitals who appear to be significant outliers in documented Length of Stay (LOS) compared to DRG Average Length of Stay (ALOS). ALOS is determined for each DRG by CMS and is indicated in the annual WV Medicaid IPPS DRG Weight Updates. Research reveals that Hospitals having patients whose LOS frequently exceed or are under the ALOS for specific DRGs may have coding or billing practices that do not provide the appropriate diagnostic and or procedural criteria for the DRG. This model will analyze hospitals' DRGs and identify patients' documented LOS compared to the DRG's ALOS. The total number of members included in the study are those where their LOS was less than 25% of the ALOS. LOS for each patient's DRG was derived from the universe of claims subject to this model for the study period. Exclusions to the review exclude those patients who Left Against Medical Advice, Expired, those who were Still Inpatients, and those whose LOS exceed the ALOS as these have been found to not likely result in overpayment.</p>	<p>Business Rule 1: When billing a discharge which would result in the LOS of the member equaling less than 75% of the ALOS for the DRG the claim will be denied and returned to the provider with direction to confirm the appropriateness of the DRG billed and resubmit the claim. The provider will be required to obtain prior authorization in order to resubmit the claim with the same DRG and receive payment.</p>														

West Virginia Bureau for Medical Services
And Marshall University Research Corporation
Data Analytics Pilot Program

Analytic Results	Cost Savings Projection										
<ul style="list-style-type: none"> • Number of outliers identified by model: 59 • Potential Short-Term ROI: \$2,931,460.70 • Potential Cost Avoidance: \$4,007,277 	Analysis indicates that implementation of this business rule criteria could prevent a considerable number of inappropriate or noncompliant claims from being paid or allow them to be recovered. The potential savings that could be realized by utilizing this edit are:										
<p>Observations/Recommendations</p> <ul style="list-style-type: none"> • Variance across payers may be indicative of inconsistent application of the billing policy. Initial Model rejected all claims and assumed no re-billing of the claim. Revised model allows for rebilling and assumes that the claim will be rebilled but will be paid at the next lowest (or lowest depending on position within the cluster) DRG weight in the cluster. The difference in these (initial claim – revised claim) is determined to be the amount possibly recovered. 		<p>Cost Savings Analysis</p> <table border="1"> <tr> <td>Total Risk (minus Error):</td> <td>\$8,026,553.51</td> </tr> <tr> <td>Reduction in Risk (50%):</td> <td>\$4,013,276.76</td> </tr> <tr> <td>Hours to Implement:</td> <td>40</td> </tr> <tr> <td>Cost of Control:</td> <td>\$6,000.00</td> </tr> <tr> <td>ROI</td> <td>667.88</td> </tr> </table>	Total Risk (minus Error):	\$8,026,553.51	Reduction in Risk (50%):	\$4,013,276.76	Hours to Implement:	40	Cost of Control:	\$6,000.00	ROI
Total Risk (minus Error):	\$8,026,553.51										
Reduction in Risk (50%):	\$4,013,276.76										
Hours to Implement:	40										
Cost of Control:	\$6,000.00										
ROI	667.88										
Model 27: Improper Billing Anesthesia Services											
Model Summary	Proposed Business Rules(s)										
<p>The purpose of this project is to identify providers who improperly bill for anesthesia services in accordance with BMS policy located in the external data source. The model will identify inaccurate modifier pairings as well as outliers for billed units of service based upon average for the procedure across all providers.</p>	<p>Business Rule 1: Case of Anesthesia service claims without any of following pricing modifiers: AA, QZ, AD, QK, QY QX or Monitored Anesthesia Care service modifier QS - deny the claim.</p> <p>Business Rule 1: Case of Same patient, same DOS, same CPT</p> <ul style="list-style-type: none"> a- If AA more than once -> deny b- If AA along with one of: AD/QK/QY/QX -> deny claim c- If QX and QZ are billed -> deny claim d- If multiple QZ deny claim -> deny claim e- If QX billed, search for at least one of AD/QK/QY, if none is billed, deny claim. And vice versa if any of AD/QK/QY was billed without QX, deny claim. 										

West Virginia Bureau for Medical Services
And Marshall University Research Corporation
Data Analytics Pilot Program

Analytic Results	Cost Savings Projection														
<ul style="list-style-type: none"> • Number of outliers identified by model: 490 • Potential Short-Term ROI: \$2,931,302.40 • Potential Cost Avoidance: \$4,566,761.82 	<p>Based upon the analytic results of this model, implementation of a business rule using these criteria could prevent a considerable number of inappropriate or noncompliant claims for anesthesia services from being paid. The potential savings that could result from implementing these criteria both for FFS and MCO claims are detailed below:</p>														
<p>Observations/Recommendations</p> <ul style="list-style-type: none"> • This model revealed substantial differences in policy across the payers. Appears some payers reimburse based upon units in minutes while others reimbursement 15 minutes = 1 UOS. • Given this model identifies outliers based on exceeding the average total billed by a code, medical records will be needed in each case to assess the billing and medical necessity of these outlying claims. The variations in payer's reimbursement of these services (minutes vs. 15 minutes = 1 UOS) requires substantial review/modification before pursuit 															
Model 28: Excessive Billing of Physical and Occupational Therapy															
Model Summary	Proposed Business Rules(s)														
<p>The purpose of this project is to identify members who have exceeded 20 combined dates of service for the CPT codes below without prior authorization. This includes 20 separate dates of service where one or more of the codes below were provided.</p>	<p>Business Rule 1: A hard edit across payers would be built to deny claims beyond the guidelines and require PA for the after cumulative of 20 visits.</p>														
Analytic Results	Cost Savings Projection														
<ul style="list-style-type: none"> • Number of outliers identified by model: 141 • Potential Short-Term ROI: \$51,117.00 • Potential Cost Avoidance: \$121,792.50 	<p>Analysis indicates that implementation of this business rule criteria could prevent a considerable number of inappropriate or noncompliant claims from being paid or allow them to be recovered. The potential savings that could be realized by utilizing this edit are:</p>														
<p>Observations/Recommendations</p> <ul style="list-style-type: none"> • Variance across payers may be indicative of inconsistent policy application. 															
<table border="1"> <thead> <tr> <th colspan="2" data-bbox="823 1419 1419 1461">Cost Savings Analysis</th> </tr> </thead> <tbody> <tr> <td data-bbox="823 1461 1214 1503">Total Risk (minus Error):</td> <td data-bbox="1214 1461 1419 1503">\$255,585.00</td> </tr> <tr> <td data-bbox="823 1503 1214 1545">Reduction in Risk (50%):</td> <td data-bbox="1214 1503 1419 1545">\$127,792.50</td> </tr> <tr> <td data-bbox="823 1545 1214 1587">Hours to Implement:</td> <td data-bbox="1214 1545 1419 1587">40</td> </tr> <tr> <td data-bbox="823 1587 1214 1629">Cost of Control:</td> <td data-bbox="1214 1587 1419 1629">\$6,000.00</td> </tr> <tr> <td data-bbox="823 1629 1214 1671">ROI</td> <td data-bbox="1214 1629 1419 1671">20.3</td> </tr> <tr> <td colspan="2" data-bbox="823 1671 1419 1682"> <p><i>Potential Cost Avoidance:</i> \$121,792.50</p> </td> </tr> </tbody> </table>		Cost Savings Analysis		Total Risk (minus Error):	\$255,585.00	Reduction in Risk (50%):	\$127,792.50	Hours to Implement:	40	Cost of Control:	\$6,000.00	ROI	20.3	<p><i>Potential Cost Avoidance:</i> \$121,792.50</p>	
Cost Savings Analysis															
Total Risk (minus Error):	\$255,585.00														
Reduction in Risk (50%):	\$127,792.50														
Hours to Implement:	40														
Cost of Control:	\$6,000.00														
ROI	20.3														
<p><i>Potential Cost Avoidance:</i> \$121,792.50</p>															

West Virginia Bureau for Medical Services
And Marshall University Research Corporation
Data Analytics Pilot Program

Model 29—Duplicative Billing of Physical and Occupational Therapy															
Model Summary	Proposed Business Rules(s)														
The purpose of this project is to identify members who are receiving PT/OT services in both a school-based setting as well as traditional practice providers.	Business Rule 1: Deny claims that are submitted for the same services while the person is receiving school-based PT/OT, exclusive of Summer months. A static model could also be built to deny claims for students receiving school-based PT/OT where the months JUNE-AUGUST are denied. Less flexible, depending on actual school start – end dates, but more “fire and forget” regarding maintenance.														
Analytic Results	Cost Savings Projection														
<ul style="list-style-type: none"> •Number of outliers identified by model: 42 •Potential Short-Term ROI: \$23,638.40 •Potential Cost Avoidance: \$50,919.12 	Based upon the analytic results of this model implementation of this business rule criteria would prevent a considerable number of inappropriate or noncompliant claims for anesthesia services from being paid. The potential savings that could be realized by utilizing this edit both for FFS and MCO claims are detailed below:														
Observations/Recommendations															
There are valid reasons why private and SBHS may perform services in the same month. The primary questions here relate to duplication of services which must be determined by review of the members plan of care in all or nearly all cases to determine which PT/OT providers are eligible to render service to the member. Areas of particular interest are potential duplicative services paid by FFS when member is enrolled in MCO. Qlarant recommends rerunning this model for the period of time WV schools were closed due to the COVID 19 pandemic to see if results reflect billing of services during a time when school was not in session.	<table border="1"> <thead> <tr> <th colspan="2">Cost Savings Analysis</th> </tr> </thead> <tbody> <tr> <td>Total Risk (minus Error):</td> <td>\$125,838.23</td> </tr> <tr> <td>Reduction in Risk (50%):</td> <td>\$62,919.12</td> </tr> <tr> <td>Hours to Implement:</td> <td>80</td> </tr> <tr> <td>Cost of Control:</td> <td>\$12,000.00</td> </tr> <tr> <td>ROI</td> <td>4.24</td> </tr> <tr> <td><i>Potential Cost Avoidance:</i></td> <td><i>\$50,919.12</i></td> </tr> </tbody> </table>	Cost Savings Analysis		Total Risk (minus Error):	\$125,838.23	Reduction in Risk (50%):	\$62,919.12	Hours to Implement:	80	Cost of Control:	\$12,000.00	ROI	4.24	<i>Potential Cost Avoidance:</i>	<i>\$50,919.12</i>
Cost Savings Analysis															
Total Risk (minus Error):	\$125,838.23														
Reduction in Risk (50%):	\$62,919.12														
Hours to Implement:	80														
Cost of Control:	\$12,000.00														
ROI	4.24														
<i>Potential Cost Avoidance:</i>	<i>\$50,919.12</i>														
Model 30- Exploratory Model for FEID Relationships															
Model Summary	Proposed Business Rules(s)														
The purpose is to identify providers who have multiple billing provider identifiers under a single tax ID.	Business Rule 1: Implement prior authorization requirements for claims billed to a Tax ID which is not affiliated with the reported servicing provider ID.														

West Virginia Bureau for Medical Services
And Marshall University Research Corporation
Data Analytics Pilot Program

Analytic Results	Cost Savings Projection
<ul style="list-style-type: none"> • Number of outliers identified by model: 309 • Potential Cost Avoidance: \$3,814,518.02 	Based upon the analytic results of this model implementation of this business rule criteria would prevent a considerable number of inappropriate or noncompliant claims for anesthesia services from being paid. The potential savings that could be realized by utilizing this edit both for FFS and MCO claims are detailed below:
<p>Observations/Recommendations</p> <ul style="list-style-type: none"> • This model may reveal duplicate or improper billing by providers billing under multiple provider IDs for the same/similar services or identify improper referral patterns. Exploration and clear approach are needed to inform additional analytics for FEID or owner/officer issues. Currently source data available to Qlarant does not include owner/officer file for inclusion. • This model may identify provider groupings that have had prior overpayments or fraud referrals. Further reviewing the results by FEID to determine shared patients may also yield areas of interest. One FEID number incorporates 19 different NPIs/Billing IDs. There are many possibilities for these results depending upon approach and goal. Recommend including MCO providers/services into this model as much more powerful with combined data of majority of the program is managed care. 	
Model 32: Excessive Emergency Room (ER) with Prescription	
Model Summary	Proposed Business Rules(s)
<p>The purpose of this project is to identify members who are potentially excessively utilizing the services of ER providers to receive opioids. This model will identify members who have had 6 or more ER visits in 6 months. (99281-99285) This model will also identify all opioids this member is or has received over the same time frame. This model may identify members who need to be engaged in care coordination, lock in programs or seek addiction treatment.</p>	<p>Business Rule 1: Provide targeted education whenever a provider is identified as having billed more than 1 ER visit with a prescription to a single member on a single date of service.</p>
Analytic Results	Cost Savings Projection
<ul style="list-style-type: none"> • Number of outliers identified by model: 310 • Potential Cost Avoidance: \$7,317,706.53 	Based upon the analytic results of this model, implementation of a business rule using these criteria could prevent a considerable number unnecessary ER visit. The potential savings that could result from implementing these criteria both for FFS and MCO claims are detailed below:
<p>Observations/Recommendations</p> <ul style="list-style-type: none"> • This identifies members with excessive ER visits by payer. This model can be further expanded in the future to identify ER with prescriptions as originally anticipated which 	

West Virginia Bureau for Medical Services
And Marshall University Research Corporation
Data Analytics Pilot Program

<p>may reflect members who are drug seeking through ER services.</p> <ul style="list-style-type: none"> Given the overpayments identified are likely driven by provider behavior in most cases the expected reduction in risk is less than other models primarily concerned with provider behavior. As such, the ROI for this model will be derived from cost savings resulting from improved care management and avoiding unnecessary or preventable visits to an ER. 	<table border="1"> <thead> <tr> <th colspan="2">Cost Savings Analysis</th> </tr> </thead> <tbody> <tr> <td>Total Risk (minus Error):</td> <td>\$73,477,065.36</td> </tr> <tr> <td>Reduction in Risk (10%):</td> <td>\$7,347,706.53</td> </tr> <tr> <td>Hours to Implement:</td> <td>200</td> </tr> <tr> <td>Cost of Control:</td> <td>\$30,000.00</td> </tr> <tr> <td>ROI:</td> <td>243.92</td> </tr> <tr> <td colspan="2"><i>Potential Cost Avoidance: \$7,317,706.53</i></td> </tr> </tbody> </table>	Cost Savings Analysis		Total Risk (minus Error):	\$73,477,065.36	Reduction in Risk (10%):	\$7,347,706.53	Hours to Implement:	200	Cost of Control:	\$30,000.00	ROI:	243.92	<i>Potential Cost Avoidance: \$7,317,706.53</i>	
Cost Savings Analysis															
Total Risk (minus Error):	\$73,477,065.36														
Reduction in Risk (10%):	\$7,347,706.53														
Hours to Implement:	200														
Cost of Control:	\$30,000.00														
ROI:	243.92														
<i>Potential Cost Avoidance: \$7,317,706.53</i>															
Model 37- Modifier 50 Inappropriate Billing															
Model Summary	Proposed Business Rules(s)														
<p>The purpose of this project is to identify providers who inappropriately bill Modifier 50 in an effort to increase reimbursement improperly. Modifier 50 is used to report bilateral procedures that are performed during the same operative session by the same physician in either separate operative areas (e.g. hands, feet, legs, arms, ears), or one (same) operative area (e.g. nose, eyes, breasts). Any provider who bills Modifier 50 in units greater than one (1) or in or who also bills the same code with no modifier, modifier RT or modifier LT on the same or across multiple claims on the same date of service will be deemed an overpayment.</p>	<p>Business Rule 1: If there are more than one procedures submitted on any particular date of service without the appropriate modifier(s) it would be denied and returned to the provider with guidance to rebill the claims with the appropriate modifier.</p>														
Analytic Results	Cost Savings Projection														
<ul style="list-style-type: none"> Number of outliers identified by model: 319 Potential Short-Term ROI: \$430,456.00 Potential Cost Avoidance: \$268,049.04 	<p>Based upon the analytic results of this model implementation of this business rule criteria would prevent a considerable number of inappropriate or noncompliant claims for anesthesia services from being paid. The potential savings that could be realized by utilizing this edit both for FFS and MCO claims are detailed below:</p>														
Observations/Recommendations	<table border="1"> <thead> <tr> <th colspan="2">Cost Savings Analysis</th> </tr> </thead> <tbody> <tr> <td>Total Risk (minus Error):</td> <td>\$560,098.07</td> </tr> <tr> <td>Reduction in Risk (50%):</td> <td>\$280,049.04</td> </tr> <tr> <td>Hours to Implement:</td> <td>80</td> </tr> <tr> <td>Cost of Control:</td> <td>\$12,000.00</td> </tr> <tr> <td>ROI:</td> <td>22.34</td> </tr> <tr> <td colspan="2"><i>Potential Cost Avoidance: \$268,049.04</i></td> </tr> </tbody> </table>	Cost Savings Analysis		Total Risk (minus Error):	\$560,098.07	Reduction in Risk (50%):	\$280,049.04	Hours to Implement:	80	Cost of Control:	\$12,000.00	ROI:	22.34	<i>Potential Cost Avoidance: \$268,049.04</i>	
Cost Savings Analysis															
Total Risk (minus Error):	\$560,098.07														
Reduction in Risk (50%):	\$280,049.04														
Hours to Implement:	80														
Cost of Control:	\$12,000.00														
ROI:	22.34														
<i>Potential Cost Avoidance: \$268,049.04</i>															
<ul style="list-style-type: none"> This model is very efficient and should yield supportable results as model identifies non-compliance with standard coding practices. Medical records will be needed in some cases to determine the appropriate overpayment recovery amount. 															

West Virginia Bureau for Medical Services
And Marshall University Research Corporation
Data Analytics Pilot Program

Model 38- Excessive Definitive Drug Testing															
Model Summary	Proposed Business Rules(s)														
<p>The purpose of this project is to identify excessive drug testing services provided to members. BMS has updated drug-testing policy effective 7/1/2018. WV Medicaid policy at 529.2 states: "West Virginia Medicaid covers up to 24 presumptive drug screens and 12 definitive drug tests (testing under 22 drug classes) per calendar year without a medical necessity authorization from the Bureau for Medical Services' Utilization Management Contractor (UMC). To exceed this benefit limit, providers must contact the UMC for a medical necessity authorization prior to payment.</p>	<p>Business Rule 1: To implement a real time dashboard to track how many times the patient has received a definitive drug test and at what doctor (since sometimes the patients go from doctor to doctor. Data from this dashboard could be used to determine when a member has exceeded their annual UDS limit regardless of their current payer.</p>														
Analytic Results	Cost Savings Projection														
<ul style="list-style-type: none"> •Number of outliers identified by model: 28 •Potential Long-Term ROI: \$2,188.80 •Potential Cost Avoidance: \$897.23 	<p>Based upon the analytic results of this model implementation of this business rule criteria would prevent a considerable number of inappropriate or noncompliant claims for anesthesia services from being paid. The potential savings that could be realized by utilizing this edit both for FFS and MCO claims are detailed below:</p> <table border="1"> <thead> <tr> <th colspan="2">Cost Savings Analysis</th> </tr> </thead> <tbody> <tr> <td>Total Risk (minus Error):</td> <td>\$13,794.46</td> </tr> <tr> <td>Reduction in Risk (50%):</td> <td>\$6,897.23</td> </tr> <tr> <td>Hours to Implement:</td> <td>40</td> </tr> <tr> <td>Cost of Control:</td> <td>\$6,000.00</td> </tr> <tr> <td>ROI</td> <td>0.15</td> </tr> <tr> <td><i>Potential Cost Avoidance:</i></td> <td><i>\$897.23</i></td> </tr> </tbody> </table>	Cost Savings Analysis		Total Risk (minus Error):	\$13,794.46	Reduction in Risk (50%):	\$6,897.23	Hours to Implement:	40	Cost of Control:	\$6,000.00	ROI	0.15	<i>Potential Cost Avoidance:</i>	<i>\$897.23</i>
Cost Savings Analysis															
Total Risk (minus Error):		\$13,794.46													
Reduction in Risk (50%):	\$6,897.23														
Hours to Implement:	40														
Cost of Control:	\$6,000.00														
ROI	0.15														
<i>Potential Cost Avoidance:</i>	<i>\$897.23</i>														
Observations/Recommendations															
<ul style="list-style-type: none"> • Consideration must be given to members who exceed the authorized limits based upon prior authorizations due to medical necessity. This model however may identify providers who have a standard practice of conducting these tests whether or not they are ordered. 															

West Virginia Bureau for Medical Services
And Marshall University Research Corporation
Data Analytics Pilot Program

Model 39- Excessive Presumptive Drug Testing															
Model Summary	Proposed Business Rules(s)														
<p>The purpose of this project is to identify providers who perform/order excessive presumptive drug testing services. BMS has updated drug-testing policy effective 7/1/2018. WV Medicaid policy at 529.2 states: “West Virginia Medicaid covers up to 24 presumptive drug screens and 12 definitive drug tests (testing under 22 drug classes) per calendar year without a medical necessity authorization from the Bureau for Medical Services’ Utilization Management Contractor (UMC). To exceed this benefit limit, providers must contact the UMC for a medical necessity authorization prior to payment. The criteria for this model are any combination of the codes below exceed the limit indicated in policy above.</p>	<p>Business Rule 1: To implement a real time dashboard to track how many times the patient has received a definitive drug test and at what doctor (since sometimes the patients go from doctor to doctor. Data from this dashboard could be used to determine when a member has exceeded their annual UDS limit regardless of their current payer.</p>														
Analytic Results	Cost Savings Projection														
<ul style="list-style-type: none"> •Number of outliers identified by model: 76 •Potential Long-Term ROI: \$11,741.60 •Potential Cost Avoidance: \$4,296.28 	<p>Based upon the analytic results of this model implementation of this business rule criteria would prevent a considerable number of inappropriate or noncompliant claims for anesthesia services from being paid. The potential savings that could be realized by utilizing this edit both for FFS and MCO claims are detailed below:</p> <table border="1"> <thead> <tr> <th colspan="2">Cost Savings Analysis</th> </tr> </thead> <tbody> <tr> <td>Total Risk (minus Error):</td> <td>\$20,592.55</td> </tr> <tr> <td>Reduction in Risk (50%):</td> <td>\$10,296.28</td> </tr> <tr> <td>Hours to Implement:</td> <td>40</td> </tr> <tr> <td>Cost of Control:</td> <td>\$6,000.00</td> </tr> <tr> <td>ROI</td> <td>0.72</td> </tr> <tr> <td><i>Potential Cost Avoidance:</i></td> <td><i>\$4,296.28</i></td> </tr> </tbody> </table>	Cost Savings Analysis		Total Risk (minus Error):	\$20,592.55	Reduction in Risk (50%):	\$10,296.28	Hours to Implement:	40	Cost of Control:	\$6,000.00	ROI	0.72	<i>Potential Cost Avoidance:</i>	<i>\$4,296.28</i>
Cost Savings Analysis															
Total Risk (minus Error):	\$20,592.55														
Reduction in Risk (50%):	\$10,296.28														
Hours to Implement:	40														
Cost of Control:	\$6,000.00														
ROI	0.72														
<i>Potential Cost Avoidance:</i>	<i>\$4,296.28</i>														
Observations/Recommendations															
<ul style="list-style-type: none"> • Consideration must be given to members who exceed the authorized limits based upon prior authorizations due to medical necessity. This model however may identify providers who have a standard practice of conducting these tests whether or not they are ordered. • This model is efficient and identifies multiple outlier categories. Medical records may be needed in a narrow subset of cases. 															

West Virginia Bureau for Medical Services
And Marshall University Research Corporation
Data Analytics Pilot Program

Model 45: Hospital-to-Hospital Transfer															
Model Summary	Proposed Business Rules(s)														
<p>The purpose of this project is to identify beneficiaries who are discharged from one hospital and admitted in another on the same date of service with a discharge status code from the originating hospital. The goal of the model is to identify inpatient claim pairs (services provided on the discharge date from one location and admitted (admission date) to a second facility on the same date of service. This would indicate the first facility discharge date is the same as the second facility's admission date. This billing practice may indicate a same-day transfer occurred and incorrect coding may exist.</p>	<p>Business Rule 1: Implement a logic for all the inpatient claims where the discharge status code is not equal to 02 to check if there is any other inpatient admission claim from a different hospital for the same patient on the same day. Sometimes the claims may not be submitted at the same time in that case just flag the patients and the claims to check for any claims from different hospital.</p> <p>Targeted Provider Education: Provide the training to the physicians/billing staff on what are the different types of discharge status codes and which code needs to be billed for Hospital-to-Hospital transfer.</p>														
Analytic Results	Cost Savings Projection														
<ul style="list-style-type: none"> • Number of outliers identified by model: 39 • Potential Short-Term ROI: \$100,419.03 • Potential Cost Avoidance: \$239,047.08 	<p>Based upon the analytic results of this model, implementation of a business rule using these criteria could prevent a considerable number of inappropriate or noncompliant claims for Hospital-to-Hospital transfer services from being paid. The potential savings that could result from implementing these criteria both for FFS and MCO claims are detailed below:</p> <table border="1"> <thead> <tr> <th colspan="2">Cost Savings Analysis</th> </tr> </thead> <tbody> <tr> <td>Total Risk (minus Error):</td> <td>\$502,094.17</td> </tr> <tr> <td>Reduction in Risk (50%):</td> <td>\$251,047.08</td> </tr> <tr> <td>Hours to Implement:</td> <td>80</td> </tr> <tr> <td>Cost of Control:</td> <td>\$12,000.00</td> </tr> <tr> <td>ROI</td> <td>19.92</td> </tr> <tr> <td><i>Potential Cost Avoidance:</i></td> <td><i>\$239,047.08</i></td> </tr> </tbody> </table>	Cost Savings Analysis		Total Risk (minus Error):	\$502,094.17	Reduction in Risk (50%):	\$251,047.08	Hours to Implement:	80	Cost of Control:	\$12,000.00	ROI	19.92	<i>Potential Cost Avoidance:</i>	<i>\$239,047.08</i>
Cost Savings Analysis															
Total Risk (minus Error):	\$502,094.17														
Reduction in Risk (50%):	\$251,047.08														
Hours to Implement:	80														
Cost of Control:	\$12,000.00														
ROI	19.92														
<i>Potential Cost Avoidance:</i>	<i>\$239,047.08</i>														
Observations/Recommendations															
<ul style="list-style-type: none"> • This model clearly identifies outliers as those who had a discharge date from one inpatient facility and a same day admission date to another inpatient facility. The only concern with this particular model is the stated data integrity issue relating to discharge dates where workarounds were applied rather than a definitive discharge date. • Recommend pursuit of all providers as medical records should not be needed to recovery overpayments made by providers billing a discharge service when the member is transferred to another hospital. BMS pays transfer cases on a graduated per diem basis up to the full DRG payment amount. Should also consider any variations in individual MCO payer policies. 															
Model 46: Hospital Admission –Observation Services Within 24 Hours															
Model Summary	Proposed Business Rules(s)														
<p>The purpose of this project is to identify billing of observation and other outpatient services for beneficiaries who were admitted to an inpatient status within 24 hours of the observation services. This project will identify members who had claims for outpatient/observation</p>	<p>Business Rule 1: BMS 2006 rule states that OBS billed within 24 hours of an IP admission become part of the IP stay. The edit would deny OBS claims separate from the IP stay when they occur within 24 hours of an IP stay.</p>														

West Virginia Bureau for Medical Services
And Marshall University Research Corporation
Data Analytics Pilot Program

services on the same day or 1 day prior to the admission date to the hospital.															
Analytic Results	Cost Savings Projection														
<ul style="list-style-type: none"> • Number of outliers identified by model: 55 • Potential Short-Term ROI: \$55,904.91 • Potential Cost Avoidance: \$16,361.96 	<p>Analysis indicates that implementation of this business rule criteria could prevent a considerable number of inappropriate or noncompliant claims from being paid or allow them to be recovered. The potential savings that could be realized by utilizing this edit are:</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="2" style="background-color: #d9ead3;">Cost Savings Analysis</th> </tr> </thead> <tbody> <tr> <td>Total Risk (minus Error):</td> <td style="text-align: right;">\$44,723.93</td> </tr> <tr> <td>Reduction in Risk (50%):</td> <td style="text-align: right;">\$22,361.96</td> </tr> <tr> <td>Hours to Implement:</td> <td style="text-align: right;">40</td> </tr> <tr> <td>Cost of Control:</td> <td style="text-align: right;">\$6,000.00</td> </tr> <tr> <td style="text-align: right;">ROI</td> <td style="text-align: right;">2.73</td> </tr> <tr> <td colspan="2"><i>Potential Cost Avoidance:</i> \$16,361.96</td> </tr> </tbody> </table>	Cost Savings Analysis		Total Risk (minus Error):	\$44,723.93	Reduction in Risk (50%):	\$22,361.96	Hours to Implement:	40	Cost of Control:	\$6,000.00	ROI	2.73	<i>Potential Cost Avoidance:</i> \$16,361.96	
Cost Savings Analysis															
Total Risk (minus Error):	\$44,723.93														
Reduction in Risk (50%):	\$22,361.96														
Hours to Implement:	40														
Cost of Control:	\$6,000.00														
ROI	2.73														
<i>Potential Cost Avoidance:</i> \$16,361.96															
Observations/Recommendations															
<ul style="list-style-type: none"> • Variance across payers may be indicative of inconsistent application of the billing policy. 															
Model 48: Medical Necessity – Benzodiazepines															
Model Summary	Proposed Business Rules(s)														
The purpose of this project is to identify providers that are authorizing continuous amounts of drugs in the benzodiazepine class. Most benzodiazepines are classified as controlled substances and are often sought after for illicit use in combination with other licit and illicit drugs or substances.	<p>Business Rule 1: Retrospectively capture prescriptions of benzodiazepines and redeem any prescription of more than 120 tablets within 25 days as an outlier</p> <p>Business Rule 2: At the point of sale (POS) when prescription is being filled at the pharmacy, by creating a threshold of 120 capsules per 25 days then a prescription can be stopped from being processed.</p>														
Analytic Results	Cost Savings Projection														
<ul style="list-style-type: none"> • Number of outliers identified by model: 803 • Potential Short-Term ROI: 20,377.71 • Potential Cost Avoidance: \$46,444.28 	<p>Based upon the analytic results of this model, implementation of a business rule using these criteria could identify providers that are authorizing continuous amounts of drugs in the benzodiazepine class. The potential savings that could result from implementing these criteria both for FFS claims are detailed below:</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="2" style="background-color: #d9ead3;">Cost Savings Analysis</th> </tr> </thead> <tbody> <tr> <td>Total Risk (minus Error):</td> <td style="text-align: right;">\$104,888.57</td> </tr> <tr> <td>Reduction in Risk (50%):</td> <td style="text-align: right;">\$52,444.28</td> </tr> <tr> <td>Hours to Implement:</td> <td style="text-align: right;">40</td> </tr> <tr> <td>Cost of Control:</td> <td style="text-align: right;">\$6,000.00</td> </tr> <tr> <td style="text-align: right;">ROI</td> <td style="text-align: right;">7.74</td> </tr> <tr> <td colspan="2"><i>Potential Cost Avoidance:</i> \$46,444.28</td> </tr> </tbody> </table>	Cost Savings Analysis		Total Risk (minus Error):	\$104,888.57	Reduction in Risk (50%):	\$52,444.28	Hours to Implement:	40	Cost of Control:	\$6,000.00	ROI	7.74	<i>Potential Cost Avoidance:</i> \$46,444.28	
Cost Savings Analysis															
Total Risk (minus Error):	\$104,888.57														
Reduction in Risk (50%):	\$52,444.28														
Hours to Implement:	40														
Cost of Control:	\$6,000.00														
ROI	7.74														
<i>Potential Cost Avoidance:</i> \$46,444.28															
Observations/Recommendations															
<ul style="list-style-type: none"> • This model does an effective job of identifying possible aberrant prescribing behavior for the drug class benzodiazepines or benzos. Benzos are often used in conjunction with opioids as a potentiator but have their own dangers. Tracking abnormal dispensing behavior by prescribers can help to combat prescription drug abuse of many different types of drugs. 															

West Virginia Bureau for Medical Services
And Marshall University Research Corporation
Data Analytics Pilot Program

FFS – only Models															
Model 34: Hospice LOS Greater Than 180 Days															
Model Summary	Proposed Business Rules(s)														
<p>The purpose of this project is to identify members who have exceeded the average stay of 6 months or longer after admission to a hospice facility. While it is feasible that members can certainly live longer than the suggested period of 6 months in a hospice facility this would be an aberration if members regularly exceed this criterion. This model should identify members where the LOS exceeds 180 days at a single provider location or across multiple providers and locations. This model should include each span at the various hospices of which, there was an admission during the period of the model. Outliers would be defined as any member where the combined LOS (admission to discharge) exceeds 180 days.</p>	<p>Business Rule 1: Implement an edit to identify the hospice claims, and the patients identified, to track the LOS and the transfers to hospice facilities. The State will identify the patients who exceed a LOS greater then 180 days. Once the patients are identified, a manual review is required to verify the LOS and transfer status. Alternatively, a dashboard can be built and operationalized to be used by BMS reviewers to identify the patients’ LOS status.</p>														
Analytic Results	Cost Savings Projection														
<ul style="list-style-type: none"> • Number of outliers identified by model: 3 • Potential Short-Term ROI: \$1,363,240.08 • Potential Cost Avoidance: \$3,265,600.21 	<p>Based upon the analytic results of this model, implementation of a business rule using these criteria could prevent a considerable number of inappropriate or noncompliant claims for Hospice services from being paid. The potential savings that could result from implementing these criteria for FFS claims are detailed below:</p>														
Observations/Recommendations	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="2" style="text-align: left;">Cost Savings Analysis</th> </tr> </thead> <tbody> <tr> <td style="padding: 2px;">Total Risk (minus Error):</td> <td style="text-align: right; padding: 2px;">\$6,816,200.42</td> </tr> <tr> <td style="padding: 2px;">Reduction in Risk (50%):</td> <td style="text-align: right; padding: 2px;">\$3,408,100.21</td> </tr> <tr> <td style="padding: 2px;">Hours to Implement:</td> <td style="text-align: right; padding: 2px;">950</td> </tr> <tr> <td style="padding: 2px;">Cost of Control:</td> <td style="text-align: right; padding: 2px;">\$142,500.00</td> </tr> <tr> <td style="padding: 2px;">ROI</td> <td style="text-align: right; padding: 2px;">22.92</td> </tr> <tr> <td colspan="2" style="padding: 2px;"><i>Potential Cost Avoidance: \$3,265,600.21</i></td> </tr> </tbody> </table>	Cost Savings Analysis		Total Risk (minus Error):	\$6,816,200.42	Reduction in Risk (50%):	\$3,408,100.21	Hours to Implement:	950	Cost of Control:	\$142,500.00	ROI	22.92	<i>Potential Cost Avoidance: \$3,265,600.21</i>	
Cost Savings Analysis															
Total Risk (minus Error):	\$6,816,200.42														
Reduction in Risk (50%):	\$3,408,100.21														
Hours to Implement:	950														
Cost of Control:	\$142,500.00														
ROI	22.92														
<i>Potential Cost Avoidance: \$3,265,600.21</i>															
<ul style="list-style-type: none"> • Recommend a review of all identified outliers. This model may identify improper utilization of hospice services where a provider regularly has patients that exceed the 180 days threshold/baseline. • Current policy allows 180 days of hospice care before recertification is required. 															

West Virginia Bureau for Medical Services
And Marshall University Research Corporation
Data Analytics Pilot Program

Model 40: Improper Billing of Personal Care Services During Inpatient Stay															
Model Summary	Proposed Business Rules(s)														
<p>The purpose of this project is to identify providers who improperly bill for personal care services (T1019) while the patient is not eligible to receive such services. Direct Care services may be provided on the day of admission and day of discharge. PC services cannot be billed when a PC member is temporarily or semi-permanently staying out of state, i.e., vacation or visiting family.</p> <p>Any provider services billed during one of the above inpatient stays (excluding admission and discharge date) will be deemed an overpayment. If data has known issues this model may not be viable for development.</p>	<p>Business Rule 1: Implement a logic to deny the PCS claims without any documentation that were billed for patients who has an inpatient claim during the same period.</p> <p>Targeted Provider Education: Training the physicians/billing staff how and when to provide the personal care services. This can be a sentinel event to track the physicians billing before and after the training. https://www.cms.gov/Medicare-Medicaid-Coordination/Fraud-Prevention/Medicaid-Integrity-Education/Downloads/pcs-prevent-improperpayment-booklet.pdf</p>														
Analytic Results	Cost Savings Projection														
<ul style="list-style-type: none"> • Number of outliers identified by model: 62 • Potential Short-Term ROI: \$750,789.60 • Potential Cost Avoidance: \$770,944.82 	<p>Based upon the analytic results of this model, implementation of a business rule using these criteria could prevent a considerable number of inappropriate or noncompliant claims for Personal Care services from being paid. The potential savings that could result from implementing these criteria for FFS claims are detailed below:</p> <table border="1"> <thead> <tr> <th colspan="2">Cost Savings Analysis</th> </tr> </thead> <tbody> <tr> <td>Total Risk (minus Error):</td> <td>\$1,561,089.65</td> </tr> <tr> <td>Reduction in Risk (50%):</td> <td>\$780,544.82</td> </tr> <tr> <td>Hours to Implement:</td> <td>64</td> </tr> <tr> <td>Cost of Control:</td> <td>\$9,600.00</td> </tr> <tr> <td>ROI</td> <td>80.31</td> </tr> <tr> <td><i>Potential Cost Avoidance:</i></td> <td><i>\$770,944.82</i></td> </tr> </tbody> </table>	Cost Savings Analysis		Total Risk (minus Error):	\$1,561,089.65	Reduction in Risk (50%):	\$780,544.82	Hours to Implement:	64	Cost of Control:	\$9,600.00	ROI	80.31	<i>Potential Cost Avoidance:</i>	<i>\$770,944.82</i>
Cost Savings Analysis															
Total Risk (minus Error):		\$1,561,089.65													
Reduction in Risk (50%):	\$780,544.82														
Hours to Implement:	64														
Cost of Control:	\$9,600.00														
ROI	80.31														
<i>Potential Cost Avoidance:</i>	<i>\$770,944.82</i>														
Observations/Recommendations															
<ul style="list-style-type: none"> • BMS allows personal care providers to span bill over the course of time (normally one month). This span billing promotes the overlap concept and yields identification as an outlier when in fact after reviewing the medical records the PCS provider did not bill on the specific inpatient days. • Recommend prohibiting the practice of span billing which would negate the need to medical record review for determination of overpayment. Medical records must be reviewed to determine the exact overpayment amount. Caution: Overpayment likely significantly overstated as all services billed for the span billed period is determined payment at risk since there is no method to identify services provided on the dates the member was in an inpatient setting. The payment at risk is likely to be reduced significantly due to the providers billing an entire month and this being calculated as payment at risk. 															

West Virginia Bureau for Medical Services
And Marshall University Research Corporation
Data Analytics Pilot Program

MCO – Only Models															
Model 05: MCO Capitation After Death															
Model Summary	Proposed Business Rules(s)														
The purpose of this project is to identify MCOs who continue to bill for monthly capitation for individual beneficiaries who in the prior month(s) were deceased. MCOs should return as not eligible any monthly capitation payments made after the month in which the member died.	Business Rule 1: BMS should validate the date of death (DOD) with the HSC data to remove any inconsistencies in the WV Medicaid claims data. As part of this validation, BMS should also compare HSC data to the federally maintained Death Master File at least once per quarter and review its current processes to ensure the HSC data is not altered or overwritten once ingested by the MMIS system.														
Analytic Results	Cost Savings Projection														
<ul style="list-style-type: none"> • Number of outliers identified by model: 4 • Potential Short-Term ROI: \$884,576.80 • Potential Cost Avoidance: \$459,664.92 	Based upon the analytic results of this model, implementation of a business rule using these criteria could prevent a considerable number of inappropriate or noncompliant claims for after death capitations from being paid. The potential savings that could result from implementing these criteria for MCO claims are detailed below:														
Observations/Recommendations															
<ul style="list-style-type: none"> • Delays in receipt of death notifications may create part of the issue; however, death older than 3 months from PMPM payment should be identifiable by the MCO/State. • This model should be easily recoupable, as no medical records would be needed. PMPM payments to the applicable payer is sufficient to request recovery. The State should review potential root causes and develop collaborative response to negate occurrences in the future. Identify average time from death to notification and set up system editing for notification after that time frame. Are there other root causes that enable this payment error to occur? 	<table border="1"> <thead> <tr> <th colspan="2">Cost Savings Analysis</th> </tr> </thead> <tbody> <tr> <td>Total Risk (minus Error):</td> <td>\$931,329.84</td> </tr> <tr> <td>Reduction in Risk (50%):</td> <td>\$465,664.92</td> </tr> <tr> <td>Hours to Implement:</td> <td>80</td> </tr> <tr> <td>Cost of Control:</td> <td>\$12,000.00</td> </tr> <tr> <td>ROI</td> <td>76.61</td> </tr> <tr> <td><i>Potential Cost Avoidance:</i></td> <td><i>\$459,664.92</i></td> </tr> </tbody> </table>	Cost Savings Analysis		Total Risk (minus Error):	\$931,329.84	Reduction in Risk (50%):	\$465,664.92	Hours to Implement:	80	Cost of Control:	\$12,000.00	ROI	76.61	<i>Potential Cost Avoidance:</i>	<i>\$459,664.92</i>
Cost Savings Analysis															
Total Risk (minus Error):	\$931,329.84														
Reduction in Risk (50%):	\$465,664.92														
Hours to Implement:	80														
Cost of Control:	\$12,000.00														
ROI	76.61														
<i>Potential Cost Avoidance:</i>	<i>\$459,664.92</i>														
Model 35: Chiropractic Services (High Patient Count – High utilization 5 regions)															
Model Summary	Proposed Business Rules(s)														
The purpose of this project is to identify providers who have a high number of patients as well as high percentage of overall chiropractic manipulations at the 5-region level (98942). This model will identify providers who have more than 50 unique members over the course of the review period where 50% or more of the chiropractic manipulations are billed at the highest level (98942). Outlier dates of service will be identified as equal to or more than 12 members for Medicaid on a single date of service and be provided as a count for total	Targeted Provider Education: Training the providers the billing procedures/practices for high level Chiropractic services. Business Rule 1: Deny the services if it is not Spine subluxation? Make this an edit if it is not already implemented by the State. Are the new spinal diagnosis codes added to the DXE system? Accident related chiropractic services, there is a report that runs in MMIS to TPL to capture these services. Code ranges related to spinal subluxation. CPT Code 98940 Chiropractic manipulative treatment (CMT); Spinal, 1-2 regions.														

West Virginia Bureau for Medical Services
And Marshall University Research Corporation
Data Analytics Pilot Program

<p>number of dates of service where 20 were exceeded.</p>	<p>CPT Code 98941 Chiropractic manipulative treatment (CMT); Spinal, 3-4 regions. CPT Code 98942 Chiropractic manipulative treatment (CMT); Spinal, 5 regions. CPT Code 98943 Chiropractic manipulative treatment (CMT); Extraspinal, 1 or more regions</p>										
<p>Analytic Results</p>	<p>Cost Savings Projection</p>										
<ul style="list-style-type: none"> • Number of outliers identified by model: 12 • Potential Long-Term ROI: \$11,469.60 • Potential Cost Avoidance: \$7,784.56 	<p>Based upon the analytic results of this model, implementation of a business rule using these criteria could prevent a considerable number of inappropriate or noncompliant claims for Chiropractic services from being paid. The potential savings that could result from implementing these criteria for MCO claims are detailed below:</p>										
<p>Observations/Recommendations</p>	<p>Cost Savings Analysis</p> <table border="0" style="width: 100%;"> <tr> <td style="padding-right: 20px;">Total Risk (minus Error):</td> <td style="text-align: right;">\$27,569.12</td> </tr> <tr> <td>Reduction in Risk (50%):</td> <td style="text-align: right;">\$13,784.56</td> </tr> <tr> <td>Hours to Implement:</td> <td style="text-align: right;">40</td> </tr> <tr> <td>Cost of Control:</td> <td style="text-align: right;">\$6,000.00</td> </tr> <tr> <td style="text-align: right;">ROI</td> <td style="text-align: right;">1.30</td> </tr> </table>	Total Risk (minus Error):	\$27,569.12	Reduction in Risk (50%):	\$13,784.56	Hours to Implement:	40	Cost of Control:	\$6,000.00	ROI	1.30
Total Risk (minus Error):	\$27,569.12										
Reduction in Risk (50%):	\$13,784.56										
Hours to Implement:	40										
Cost of Control:	\$6,000.00										
ROI	1.30										
<ul style="list-style-type: none"> • Policy changes needed before implementing the business rules. • Recommend including FFS exposure to this model. Combining additional patients in the FFS population in addition to MCO may yield additional results for the same providers if these providers are in MCO networks as well as FFS. • Recommend including FFS patient population into the model as potentially will yield more results for the same or additional providers. Note this model can be modified to change patient population for potential optimization on a sliding scale as needed. 	<p><i>Potential Cost Avoidance: \$7,784.56</i></p>										
<p>Observations/Recommendations</p>											
<ul style="list-style-type: none"> • The allowance of providers to span bill traditional E&M services (this model identified the practice especially for hospital visits) enabled potential false positive results as the data is identifying multiple E&M services on the same date by the same billing provider. • Develop and circulate policy to disallow E&M services when billed for more than a single date of service. 											

Appendix II: Models resulting in the identification of few or no outliers

During the development process the following models were developed and resulted in the identification of few (<25 servicing providers) or no outliers. These limited results are attributable to inconsistent claims/encounter data quality, other ongoing efforts within BMS, and/or models being exploratory in nature.

- Model 01: DDS:MD Duplicate Billing
- Model 06: MCO Capitation Duplicate Payments
- Model 12: Overdose and Addiction Diagnoses with Provider Relationships
- Model 14: Duplicative MCO and FFS claims
- Model 16: Dental – Excessive Endodontic Therapy (Anterior Tooth)
- Model 17: Dental – Excessive Endodontic Therapy (Bicuspid Tooth)
- Model 18: Dental – Excessive Endodontic Therapy (Molar)
- Model 19: Dental – Excessive Periodic Oral Evaluation
- Model 20: Dental – Excessive Comprehensive Oral Evaluation
- Model 21: Dental – Excessive Sealant Per Tooth
- Model 22: Dental – Excessive Space Maintainer Fixed or Removable
- Model 24: Improper/Excessive Osteopathic Manipulative Treatment
- Model 31: Suspicious Patient Recruiting Same Address
- Model 33: Pharmacies with Distant Location Members
- Model 41: Pharmacy - Sedative Hypnotics
- Model 42: Pharmacy – Triptans
- Model 43: Pharmacy – Short Acting Opioid Analgesics
- Model 44: Pharmacy – Skeletal Muscle Relaxants:
- Model 47: Pharmacy – Carisoprodol

Appendix III: Acknowledgements

Marshall University Research Corporation Members

Michael J. McCarthy, MA., Chief Information Officer, Marshall University School of Medicine; and Marshall Health

J.T. Schneider, Director of Extramural Funding, Marshall University Joan C. Edwards School of Medicine / Marshall Health

Sheanna M. Spence, Director of External Affairs, Marshall University Joan C. Edwards School of Medicine / Marshall Health

Alfred Cecchetti, PhD, MSc, MSc IS, Director, Division of Clinical Informatics (DCI), Research Assistant Professor, Department of Clinical and Translational Sciences (DCTS) Joan C. Edwards School of Medicine

Vineela Kadiyala, MSCS, Data Architect, Operational Informatics, Marshall Health

Alia Hajjar, MCS, M.ENG., Data Analyst, Operational Informatics, Marshall Health

J. Marshall Willis, MS., Data Analyst, Operational Informatics, Marshall Health

Anastacia Chapman, MPH, CPC, CPMA, CRC, CPC-I, Coding/Billing Compliance Specialist, Marshall Health

Tammy Heaberlin, Claims Auditor, Marshall University Research Corporation

Ethan M. Jones, CFE, Claims Auditor, Marshall University Research Corporation

George Ryan, MS, MBA, MA, MDiv., Director, Operational Informatics, Marshall Health

Qlarant Integrity Solutions Team:

Tammy Hypes, Project Director, QLARANT Integrity Solutions

Di Wang, PhD/ Data Scientist, QLARANT Integrity Solutions

Lisa Su, PhD /Data Scientist, QLARANT Integrity Solutions

West Virginia Bureau for Medical Services
And Marshall University Research Corporation
Data Analytics Pilot Program

Yixin Qui, PhD, QLARANT Integrity Solutions

Kevin McCash, PhD/Data Scientist, QLARANT Integrity Solutions

Dan Edris, Data Engineer, QLARANT Integrity Solutions