



Affiliated Contractors (ACs) refers to Carriers, DMERCs, and FIs.

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### PREDICTIVE MODELING UPDATE

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#### **Predictive Modeling and Data Display Special Study Update**

The Centers for Medicare & Medicaid Services (CMS) awarded a Special Study: Predictive Modeling and Data Display to Livanta LLC ("Livanta") on July 13, 2005. The goal of the Special Study was to explore the feasibility and identify possible applications to detect improper Medicare payments. The background, timeline, methodology and status were presented in the January and February Newsletters.

#### **Task 1 - Predictive Modeling Results**

Six vendors submitted predictive modeling results for the test file for Task 1 and were evaluated by the panel. As noted in the previous Newsletter, the best model achieved a "grade" of 43% (559/1286), which was the direct result of low scores for the first and most important evaluation criterion – model predictive power.

Unfortunately, predictive modeling performance was poor for all the vendors participating in this task. The models were specifically evaluated for a capability of defining automated edits as well as edits to define cases for manual review. CMS' current business model relies on near certainty for automated edits – i.e., approximately 100 percent specificity in the selection of claims. The CERT dataset was clearly inadequate for this task, but the panel additionally concluded that even the incorporation of national claims data would not significantly improve the ability of the models to automatically deny claims in the Medicare environment.

With respect to selection for manual review, CMS' capacity is at most a 1 percent level of review. Unlike commercial programs, increased capacity cannot be justified by cost benefit analyses; it is determined by Congress as a side effect of MIP funding. Current medical review manual edits are relatively effective (25 to 75%) but are additionally structured to support global educational efforts. Though all models performed slightly better than chance, none were able to demonstrate predictive accuracy at the claim line level above methods currently in place at ACs. Furthermore, it was revealed that none of the models could obtain a significant true positive capture rate (i.e., high error identification rate) when based on the CERT dataset without reviewing a cost-prohibitive number of claims (e.g., over 1% of the total claims volume).

The predictive models not only failed to add specificity, but additionally suffered from a lack of purposeful design to target specific educational interventions; the models are designed to block aberrant patterns using high levels of review, not to identify cohorts of claims that can be used to illustrate or support an educational opportunity. There remains the possibility that models based on complete claims history could supplement existing data audit techniques, but there is no suggestion that these models could replace or significantly improve analyst-based activity at the individual contractor level.

Given that the role of predictive modeling appears limited to the analysis of extremely large and complex datasets, as opposed to either the creation of automated denials or the definition of complex parameters for review edits, any recommendation for the further use of predictive modeling at this time must be along those lines of action. This gives rise to one recommendation for deployment at a national level and one recommendation for further evaluation at the AC level.

The most efficient use of the complex analytic tools involves applying this technology at a national level since there is no reason to expect algorithms to change from state to state. These techniques could be used to identify program trends, risks, and opportunities that would then be communicated to the ACs. Since ACs lack the ability to focus resources on vulnerabilities beyond their jurisdiction, many are missing opportunities that are often revealed through analysis of data at a national level. This type of information would be used by ACs as an adjunct to their own data analysis, allowing them to better focus their limited resources and to develop special studies based on this additional information.

Although it appears that predictive modeling is not valuable at the national CERT level, there remains the possibility that individual contractors could use one or more of these tools at a local level to assist in the integration of nonrandom contractor reviews with the local subset of CERT based random reviews. At this level, the contractor will have access to the entire claims history universe for both providers and beneficiaries, along with the results of the error validation exercises (probes and edits) that are not available at the national level.

The top three vendors had models that could be used in an AC environment in which there is more robust data. Interested ACs, if they wish, can contact the vendor directly to implement a predictive modeling product that can potentially augment the AC's existing error rate reduction strategies.

The names and products are included below:

Company	Task 1 Overall Rank	Task 1 Predictive Power Rank	Product Name	Contact Information
Megaputer Intelligence	1	1	PolyAnalyst	Richie Kasprzycki 120 W 7 <sup>th</sup> Street, Suite 314 (812) 330-0110 <a href="mailto:info@megaputer.com">info@megaputer.com</a>
SPSS with SRA	2	3	Clementine	Curtis Abel 2000 North 14 <sup>th</sup> Street, Suite 320, Arlington, VA 22201 (703) 740-2440
FairIsaac Corp	3	2	Payment Optimizer	Jeff Brewer 1488 Sheridan Walk, Atlanta, GA 30324 (404) 321-6416

## Task 2 - Data Display Results

Five vendors submitted data display products for evaluation under Task 2. The two top vendors scored a combined 'grade' 80.89% and 80.08%. Those two vendors provided their best and final pricing to Livanta in early March.

The tools/applications from these vendors had quite a bit of requested functionality, and were oriented in very different directions.

The Watts application was strong in graphic representations of the data, geographic displays, and commonly used development technology; it was, however, an application specifically designed for CERT data display requirements and requires ongoing application support from the vendor.

The Fair Isaac tool was strong in generic product design and customization, comprehensive functionality, and administrator-support user capability (can turn over customization to a user administrator); however, it is a product developed for market that requires R&D recovery costs and coordination of major enhancements/upgrades with other customers.

There are several tools available that would allow ACs to have easier, more effective access to CERT data. The most efficient way to deploy those tools is with a centralized implementation. Each AC can then view, analyze, and drill into their own data, while also having the benefit of comparing themselves to aggregate, summary, and trend utilization information.

There should be one website for CERT contractors to access to see review status information and documentation status information. A separate website can exist for specific functions, such as the CMS CERT and the Provider websites, but these websites should at least link together for easier navigational access by the contractors.

The CRC Claims Status Website should be augmented with additional data that is accessible to the data display tool. Some information is currently available, such as Protected Health Information (PHI), but other information may have to be added to the CERT process.

Ultimately, all restricted CERT information should be available in a single location.

Final panel recommendation is to work with Watts and Associates to implement a prototype of the data display application.

The two top vendors and the names of their tools/applications are included below:

Company	Task 2 Rank	Product Name	Contact Information
Watts and Associates. Inc.	1	Medical Data Display	Tim Watts 4331 Hillcrest Road Billings, MT 59101 (406) 252-7776
FairIsaac Corp	2	Web Station & Payment Optimizer	Jeff Brewer 1488 Sheridan Walk, Atlanta, GA 30324 (404) 321-6416

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***The purpose of the CERT Newsletter is to provide for an exchange of information among the Centers for Medicare and Medicaid Services (CMS), the CERT Review Contractor (CRC), the CERT Documentation Contractor (CDC), Affiliated Contractors (ACs) and Providers. The Newsletter is not intended to set CMS policy or replace CMS directives. The newsletter is published monthly by CDC. Archived copies are available on the CERT Website: <http://www.certprovider.org>***

Send in questions, suggestions, and/or articles for inclusion in the newsletter to [marylou@certcdc.com](mailto:marylou@certcdc.com)  
Deadline for April 2006 issue is 31 March 2006.

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