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Cc: [Matthew Ferrara](#)
Subject: AHCA RFI - 3M HIS Response
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Attachments: [image001.jpg](#)
[image003.jpg](#)
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Good afternoon – please see the attached 3M Health Information Systems responses to the State of Florida AHCA RFI 014-21/22.

Thank you for the review, considerations, and don't hesitate to reach out if there are any questions.
Jeff

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June 3, 2022

STATE OF FLORIDA: AGENCY FOR HEALTH CARE ADMINISTRATION REQUEST FOR INFORMATION (RFI 014-21/22)

To: Cody Massa, Procurement Officer

Responses submitted by 3M Health Information System (3M HIS), 575 West Murray Blvd. Salt Lake City, UT 84123. Website: https://www.3m.com/3M/en_US/health-information-systems-us.

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Description of how the Respondent's approach will offer advantages or improvements over existing processes of the SMMC Program. The description should also identify known or potential concerns with the approach.

The Florida Agency for Health Care Administration (AHCA) is aggressively focused on advancing value within its managed care model. 3M HIS applauds this evolving effort and offers the recommendations below as additional strategies. It is 3M's belief that the recommendations below will further advance value in the Florida Medicaid program:

- **Consider risk adjustment methodology for health plan capitation that has greater functionality and is aligned with quality outcomes measures currently used by AHCA**

The AHCA/AHCA contracted actuary currently risk adjusts health plan capitation payments using the Chronic Disability Payment System risk adjustment tool (CDPS+Rx). It is unclear how much utility CDPS+RX risk scores have beyond the activity of the risk adjustment process in setting capitation rates. 3M [Clinical Risk Groups](#) (CRG) have equal predictive power when used to risk adjust capitation payments. Because the clinical categorical approach used by CRG yields much better clinical information about the enrollees, they have much more utility and versatility for AHCA, health plans and providers within a value-based care environment. See **Appendix** for a comparison of risk adjustment models.

Through its [Quality Strategy](#), AHCA has launched, in coordination with its health plans, several key initiatives focused on reducing [Potentially Preventable ED Visits \(PPV\)](#), [Potentially Preventable Hospital Admissions \(PPA\)](#), and [Potentially Preventable Readmissions \(PPR\)](#). PPV and PPA leverage 3M Clinical Risk Groups as the risk adjustment mechanism. CRG's use cases extend to health plan value-based contracting with providers, evaluation of value-based care effectiveness and return on investment, identification of candidates for additional health plan care management, identification of variation in cost and quality, etc. Leveraging CRG for both capitation risk adjustment and critical downstream activities would serve to create better alignment among the agency, health plans and providers.

- **Consider incentivizing health plan performance improvement through default enrollment process that is linked to measures of value (cost/quality)**

Health Plans are highly motivated to attract new enrollees and grow their market share. AHCA could leverage the default enrollment process to incorporate measures of value into the assignment of default pools to health plans. [Texas Medicaid implemented an approach](#) that leverages each health plan's performance on potentially preventable events as part of the scoring algorithm/resizing of default pools. AHCA could also repurpose other data that it routinely collects on health plan performance to enrich the assessment of health plan value. This initiative would establish a market level competition between health plans based on performance. Furthermore, there is some evidence that default enrollees are lower utilizers of Medicaid services, which would further motivate health plans to improve performance relative to their competitors.

- **Consider inclusion of risk adjusted, hospital-centric measures for hospital directed payment program (DPP)**

AHCA's current hospital DPP includes the follow quality measures:

- Overall Cesarean Section number
- Potentially Preventable Hospital Readmissions
- Healthcare Related Infections
- Follow-up after Hospitalization for Mental Illness

3M has worked with AHCA and its data analytics contractor on calculation of hospital rates of [Potentially Preventable Complications \(PPC\)](#) for the inpatient setting. At the time, it was contemplated that some of the PPCs would be used as quality measures in the DPP. Ultimately, it was decided that that the existing measures (listed above) would remain. 3M strongly feels that the PPCs are ideal measures for use in a hospital DPP in that they include a broad array of patient safety measures and are risk adjusted for fair comparisons. In addition to PPC software that is used in an inpatient setting, 3M will be releasing software for licensing that **measures risk adjusted rates of PPCs in an outpatient hospital setting**. Given that many procedures have shifted from an inpatient hospital setting to an outpatient hospital setting, 3M feels that this software would be an ideal complement to the current inpatient PPC software.

- **Consider leveraging 3M methodologies and services to help support, drive, and execute on the [Florida Health Care Connection \(FX\)](#) principals and trends.**

3M can help by drive value in Florida with AHCA by:

- **Enabling high quality and accessible data** – Enriched, high quality, and actionable payment and population clinical classification that scale to all populations
- **Improve health care outcomes** – Drive innovation and improved outcomes in value and population programs

- **Reduce complexity** – Simplify, normalize, and translate the language of healthcare into actionable information
- **Improve integration with partners** – Support modular cloud-based technology and services that scale to managed care and provider partnerships
- **Use evidence-based decision making** – Trusted clinical classification methodologies developed by clinical and economic experts, updated annually
- **Improve provider and recipient experiences** – Integrated into managed care and provider workflows to improve patient outcomes and experience
- **Enable good stewardship of Medicaid funds** – Align policy, program, and methodology design to drive efficient use of health system resources
- **Enable holistic decision making rather than short term focus** - Integrate equitable whole person approach that incents long term sustainable value creation

Appendix

Measuring Population Health Status in Florida: The Choice of a Population Health Status Grouper

Recommended Criteria for Choice of a Health Status Grouper

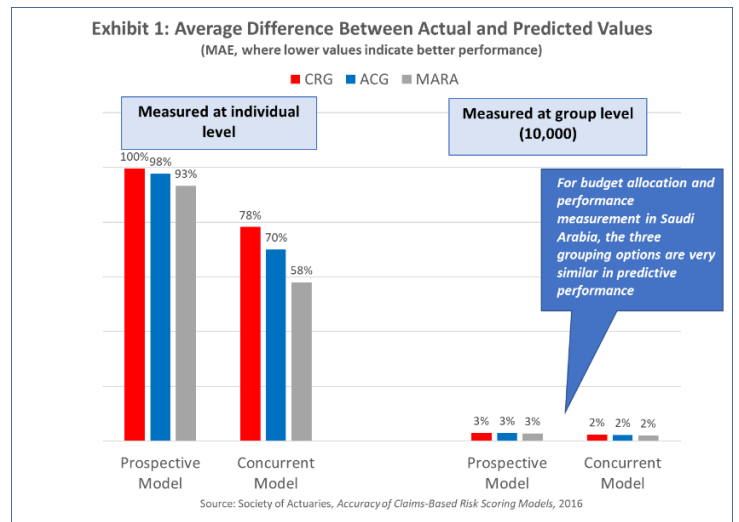
We recommend that AHCA balance four criteria in making its decision:¹

- How well does the methodology explain and predict population health expenses
- Ability to understand populations health needs across Florida Medicaid
- Promoting value-based healthcare
- Effectiveness and flexibility

1. How Well Does the Methodology Explain and Predict Population Health Expenses?

3M Clinical Risk Groups perform similarly on a statistical basis to competing methodologies (e.g., ACGs and MARA) in the measure that is most relevant to Florida Medicaid health clusters, that is, predictive power at the group level.

- In comparing population risk adjustment methodologies, the most common citation is a 2016 evaluation by the U.S. Society of Actuaries.² The most commonly quoted measure is the R^2 statistic, **which reflects the percentage of cost variation across individuals that is explained by a grouping methodology.** For example, if a formula that correlated children’s weight as a function of their height explained 50% of individual variation in weight, the R^2 would be 50%. In promoting their methodology, some of our competitors rely heavily on their R^2 results from the single SOA study, which had important limitations.
- Results need to be viewed in context. The SOA authors themselves noted:
 - R^2 should “never be the sole determinant of a model’s success or failure” (p. 56). They declare their intention “to begin to draw attention away from the R-Squared measure as a definitive metric of risk scoring success” (p. 13) Aside from over-reliance on any single statistic in a complex decision, **the R^2 can be very misleading in the presence of outlier observations.**³
 - The MarketScan database used for the evaluation mostly reflected healthcare utilization by people with commercial insurance through large U.S. employers. In fact, the SOA study omits almost all newborns, infants, and people aged 65 and over (pp. 12, 16) as well as many people with disabilities or low incomes. The omission of the 65+ population is especially notable, since they often have multiple chronic conditions.
 - Several evaluated methodologies had been developed using the MarketScan database itself, even though the SOA authors would have preferred an independent database (p. 12). This factor likely favored methodologies that were both developed and evaluated using different years of the same MarketScan database. CRGs, by contrast, were developed and evaluated using entirely separate databases.
 - Most important, the SOA authors argue – and we agree – that measuring performance at the individual level is “notably removed from the business problem that risk scoring models are



most typically employed to help solve: predicting healthcare expenditures for a group of insured individuals. We believe more useful measures for comparing models in this context are thus at the group level” (p. 21).

- When risk was evaluated at the group level, performance is “much more tightly clustered across models” (p. 22). Exhibit 1 shows two important findings:
 - The average difference between actual and predicted values drops dramatically when you look at the group level rather than the individual level
 - CRGs, ACGs, MARA perform equally well (e.g., 3%)
- When considering the relative merits of a regression based statistical model and a clinical categorical model, it is worth remembering the key differences, as shown in Exhibit 2.

The bottom line: So long as a methodology has an acceptable level of predictive power – which CRGs, ACGs, and MARA do – then the choice of a methodology should reflect other considerations.

**Exhibit 2
Differences between Clinical Categorical Models and Regression-Based Models**

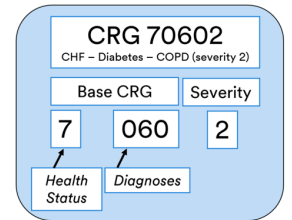
Issue	Clinical Categorical Model (3M CRGs)	Regression-based Model
Development method	Clinical model developed by clinicians	Statistical model developed with regression analysis
Structure of model	Clinically meaningful categories of enrollees subdivided into explicit severity-of-illness levels	Additive mathematical formula that computes a score for a beneficiary
Data used to compute output	Longitudinal claims data linked at the individual level	Longitudinal claims data linked at the individual level
Use for rate setting	Each clinical category has a payment weight that is converted into a payment amount: “Product with a price”	Numeric score is converted to a payment amount
Calculation and replication of payment amounts	Arithmetic average that is easily calculated for each 3M CRG independent of developers	Requires regression analysis, which can be difficult to perform independent of developers
Communication value to providers	Creates a language understood by physicians due to the explicit clinical definitions of each 3M CRG	Numeric score with minimal communication value
Update process	Selective clinical areas can be refined without affecting entire clinical model	Requires re-specification of statistical model
Response to changing practice patterns or technology	Clinical model is stable, but payment weights will change	Requires re-specification of statistical model
Use with pharmacy and/or health status information	Clinical model is stable	Requires re-specification of statistical model
Carve outs	Clinical model is stable, but payment weights will change	Requires re-specification of statistical model

2. Ability to Understand Population Health Needs across Florida

We suggest that CRGs are more powerful than competing methodologies in their ability to help health system managers and clinicians understand and improve health status in Florida. If, alternatively, AHCA chose a methodology developed mostly for allocating funds, we believe that could be a significant missed opportunity.

- Of the leading methodologies considered in the SOA evaluation, **CRGs were the only clinical categorical model**. In the CRG model, each individual in a population is assigned to a single, mutually exclusive Clinical Risk Group, including both a base CRG and a severity of illness (Exhibit 3). Additionally clinical categorical models are based on expert clinical opinion, are hierarchically structured with layers of rules governing the interactions amongst and between variables in the algorithm. All the other evaluated models were statistical regression models. (Although ACGs have a categorical component, publicly available information indicates that ACGs are primarily a regression-based approach.)
- **The CRG categorical clinical model defines groups of individuals who are similar both clinically and in their typical use of healthcare resources.** This approach creates a language that **links the clinical and financial aspects of care**. The importance of this communication value cannot be overemphasized. The best-known categorical model, Diagnosis Related Groups for inpatient care, was “arguably the most influential innovation in the history of health care financing.”⁴ As the U.S. federal government said, “Central to the success of the Medicare inpatient hospital prospective payment system is that DRGs have remained a clinical description of why the patient required hospitalization.”⁵
- Regression models, by contrast, generate **risk scores from proprietary regression models that are often difficult for clinicians to accept, interpret, and act on**.
- CRGs were developed by clinicians and researchers from 3M and what is now the national Children’s Hospital Association.⁶ An explicit goal was to recognize the interaction of chronic conditions and the gradations of severity of illness within underlying conditions. In Exhibit 3, the “7” indicates an individual with chronic diseases in three body systems; the “7060” specifies the combination of heart failure, diabetes, and COPD. The illness burden of people in base CRG 7060 can range from 1 to 6; this individual is severity 2. Every CRG has an associated relative weight (known as a risk score in the regression models) that reflects average health care cost in this CRG.
- Very specific clinical logic is used to organize data from an individual’s multiple diagnoses that had been coded using approximately 70,000 distinct ICD-10 diagnosis codes. (Procedure and drug codes can also contribute to CRG assignment.) Examples are as follows.
 - Severity level grading. A patient with asthma (base CRG 5138) is assigned to severity 1 (CRG 51381) in the absence of complications, to severity level 2 with a comorbidity of recurrent sinusitis within 90 days, to severity level 3 with a comorbidity of a major infection, or to severity level 4 with a complication of respiratory failure.
 - Hierarchy and conditionality. Extensive logic is used to consolidate similar conditions, distinguish separate conditions, and identify the most serious conditions within each organ system. For example, hierarchical rules assign a patient with diabetes and a broken leg to a CRG for diabetes. As another example, conditionality rules apply to a patient with both diabetes and skin ulcers. Although chronic skin ulcers are in the integumentary organ system, they are typically a complication of diabetes and therefore will not count as a distinct chronic disease. They will, however, be considered in assigning the diabetes severity of illness.
 - Recency. Where appropriate, CRG assignment places greater significance on more recent diagnoses and procedures.
 - Recurrence or persistence. Rules of persistence or recurrence distinguish whether certain conditions are acute or chronic. For example, a 90-day recording rule identifies acute nephritis that persists and becomes chronic.

Exhibit 3
CRG Example



- Functional status. The 3M Functional Status Groups (FSG) methodology, included within the CRG software, generates complementary information on how deficits in the activities of daily living (e.g., mobility and cognition) affect health status and resource use.⁷ FSG assignment requires patient data on functional status.
- AHCA can use CRGs to understand and **improve population health, as illustrated by these examples.**
 - Population segmentation. Florida applied CRGs to its Medicaid population of four million people. It found, for example, that 32,000 had serious chronic conditions in three or more body systems (Health Status Group 7), of which approximately 2,000 had the combination of heart failure, diabetes, and COPD (base CRG 7060).⁸
 - Clinical insight. Researchers use CRGs to conclude that children with chronic conditions in two or more body systems represented the fastest growing inpatient care cohort at 28 children’s hospitals.⁹
 - Patient data on the clinician’s desktop. New York State provides participating physicians with a dashboard showing the patient’s CRG assignment, previous CRG, “persistent high needs” status relative to resource use for the patient’s CRG, and the most recent potentially preventable admission, readmission, and ED visit.
 - Disease progression. CRGs enable tracking – and, potentially, slowing – of the progression of chronic diseases.¹⁰ An example is the percentage of people with uncomplicated diabetes who typically progress to diabetes with complications or comorbidities in a three-year period.
 - Medically complex children. CRGs are commonly used in research on medically complex children.¹¹
 - Case management. CRGs are well-suited to case management, first by categorizing patients into discrete and clinically meaningful categories, then by enabling drill-down analysis by diagnostic subgroups, and ultimately by serving as the risk adjuster to identify services of marginal value in improving health outcomes.¹²

Bottom line: Unlike opaque and non-clinical statistical models, CRGs create a common language for clinicians and financial managers to understand and improve health status at both the individual and population level.

3. Promoting Value Based Healthcare

As Florida moves down the road to value-based healthcare, the choice of h population health status measure is an essential decision. Choosing CRGs fits well with other directions AHCA may consider now or in the future.

- **Potentially preventable admissions and emergency department visits.** Several U.S. states have successfully used the 3M Potentially Preventable Admission and Potentially Preventable Emergency Department Visit methodologies to report and/or reduce the incidence of these potentially preventable events.¹³ Clinical Risk Groups were used to enable fair comparisons of results across physician groups, counties, and other groupings.
- **Episodes of care.** CRGs are a building block in the 3M Patient-focused Episode (PFE) methodology, which enables clinicians and academic researchers to change their focus from individual services to the bundle of services provided for an episode of pediatric bronchiolitis or orthopedic surgery (among many other PFE examples).¹⁴
- **Allocation of funds.** In addition to empowering clinical tools to improve population health, CRGs are well-suited to the allocation of funds across health clusters in Florida. The New York State Medicaid program, for example, uses CRGs to allocate approximately \$30 billion U.S. a year to managed care organizations. In Spain, four large health regions use CRGs to identify population morbidity and calculate capitation payment for primary care and ambulatory drugs.

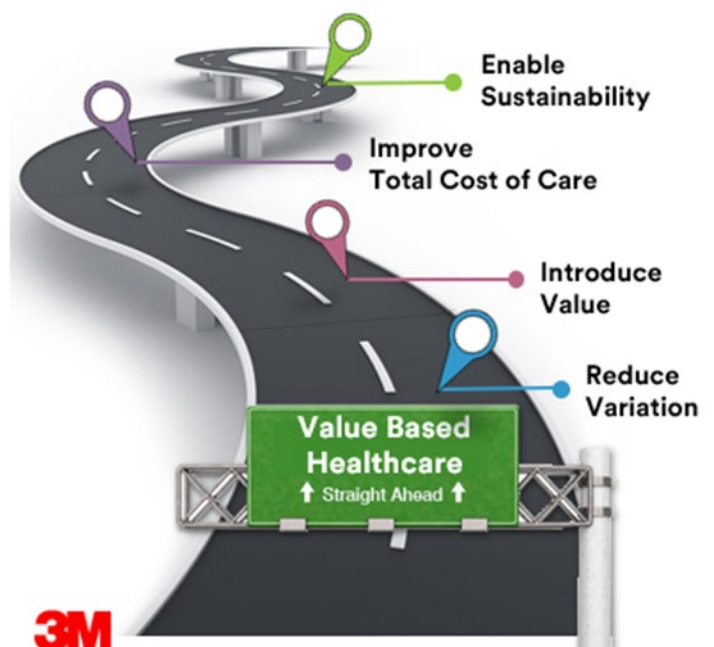
Bottom line: The goal is not just to allocate money – though CRGs perform well for that purpose – but to improve care and reduce the growth in health care spending.

4. Effectiveness and Flexibility

We suggest that AHCA staff, officials at the health cluster level, and clinicians on the front lines of health care delivery will appreciate the effectiveness and flexibility of 3M CRGs.

- **Clarity.** Every individual is assigned to a single CRG. As shown in Exhibit 3, CRGs use everyday language to define patient health status in clinical terms.
- **Granularity and aggregation.** The five-digit CRGs (base CRG + severity) are the most granular, useful to clinicians seeing patients in their office. The most aggregated level comprises the nine Health Status Groups, useful for overviews of population health status and resource use. In between are three levels of aggregation, such as ACRG3 that can be used for allocating budgets by region. As well, Diagnostic Subgroups (a CRG component) combine many closely related diagnosis codes into a history of specific conditions for each patient.
- **Transparency.** Overviews of CRG categorization are available in the public domain on the Internet¹⁵ and CRG licensees have access to the CRG Definitions Manuals that provide extensive and detailed information on how the number, nature, and interaction of diseases drive DRG assignment. Furthermore, 3M welcomes suggestions for improvement from clinicians and researchers; CRGs, unlike regression-based models, are not a “black box.”
- **Stable clinical model with separately calculated relative weights.** The categorical nature of CRGs permits separation of clinical groupings (which are generally stable) from the calculation of relative weights (which vary with differences in benefit coverage, utilization, and unit costs across populations). In Florida, CRG groupings likely would remain stable across years while relative weights could be updated to reflect changes in clinical practice and coding. The result is a consistent and powerful communication tool. Regression-based models, by contrast, require complete re-specification as practice patterns and coding evolve.¹⁶

Exhibit 4
The Road to Value Based Healthcare



- **Clinical model remains stable during clinical logic enhancements.** 3M researchers constantly look for opportunities to make CRG groupings more clinically appropriate. When these improvements are made, the rest of the clinical model typically remains unchanged. Regression-based approaches, again, require re-specification of the entire model to accommodate change.
- **Code mapping appropriate to Florida.** 3M is a world leader in the mapping of diagnosis and procedure codes; both across countries and version boundaries. We have worked with many countries at varying levels of coding sophistication, and we have witnessed coding improve as clinical information has increasing impact on resource allocation and quality measurement.

Bottom line: Because the CRG clinical categorical model is more transparent and more flexible than regression-based approaches, it lends itself to multiple uses throughout a country's health care system.

Exhibit 5 Comparison of Alternative Population Groupers

	3M Clinical Risk Groups	Johns Hopkins ACGs	Milliman Advanced Risk Adjustors
Basic Characteristics			
Approach	Clinical, categorical model. Each person is assigned to one of 392 base CRGs. When severity levels are assigned, this generates 1,474 mutually exclusive CRGs. ¹⁷	Statistical model (regression-based) on a base of categories (Aggregated Diagnosis Groups or ADGs). Each person is assigned a statistical risk score.	Statistical model (regression-based). Each person is assigned a statistical risk score.
Input data	Diagnoses, plus selective use of procedure and drug data	Diagnoses and drug data	Diagnoses and drug data
Concurrent and prospective models	Yes, both	Yes, both	Yes, both

1. How Well Does the Methodology Explain and Predict Population Health Expenses?

See discussion on page 1 for essential context in interpreting this information

Society of Actuaries study for groups of 10,000 people* – Prospective *Excludes age 65+, almost all newborns and infants, and many people with disabilities	Mean Average Error = 3.0% R ² = 12% 95 th percentile of error = 7.4%	Mean Average Error = 2.9% R ² = 19% 95 th percentile of error = 7.1%	Mean Average Error = 2.8% R ² = 22% 95 th percentile of error = 7.0%
Society of Actuaries study for groups of 10,000 people* – Concurrent *Excludes age 65+, almost all newborns and infants, and many people with disabilities	Mean Average Error = 2.4% R ² = 43% 95 th percentile of error = 5.8%	Mean Average Error = 2.2% R ² = 52% 95 th percentile of error = 5.6%	Mean Average Error = 2.0% R ² = 60% 95 th percentile of error = 5.2%

2. Ability to Understand Population Health Needs across Florida

Each individual assigned to a single clinically meaningful group	Yes (CRG)	Yes (ADG)	No
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Measure of relative resource use	Terminology is “relative weight.” Calculated as the simple average of resource cost of individuals in a given CRG.	Terminology is “risk score.” Calculated by regression analysis as the sum of coefficient values for individual diseases, with an unknown number of coefficients for interaction terms.	Terminology is “risk score.” Calculated by regression analysis as the sum of coefficient values for individual diseases, with an unknown number of coefficients for interaction terms.
Severity levels	Yes, up to 6 levels of severity, recognizing the reality that people with the same illness may have very different severities of illness	Limited	No
Functional status (activities of daily living) measurement	Yes – complementary 3M Functional Status Groups methodology adds predictive value	No	No
Pediatric emphasis	Developed by 3M in collaboration with what is now the national Children’s Hospital Association. Often used by children’s hospitals and independent researchers to measure and manage medically complex children. See bibliography, Section D.	Search of the biomedical literature finds pediatric references	Search of the biomedical literature finds no pediatric references

3. Promoting Value Based Healthcare

Compatibility with using episodes of care for analysis and payment	Fully integrated with the 3M Patient-focused Episode methodology	No companion methodology comparable in scope to 3M PFEs	No companion methodology comparable in scope to 3M PFEs
Applicability to avoidable hospital use	CRGs provide risk adjustment for the 3M methodologies for Potentially Preventable Admissions and Potentially Preventable ED Visits.	Includes predictions of future inpatient and ED use as well as identification of ED use with a presenting problem that could have been treated in an alternative setting. No companion methodology comparable in scope to 3M PPAs or PPVs.	Includes predictions of future inpatient and ED use, without distinguishing potentially avoidable use. No companion methodology comparable in scope to 3M PPAs or PPVs.

4. Effectiveness and Flexibility

Clarity	Individual is assigned to a single, clinically defined CRG. There are almost 1,500 CRGs in total with clear clinical description and each has an associated relative weight	Each individual is assigned a single ACG. There are almost 110 ACGs, their descriptions tend to be broad referencing the number of ADGs and age with no clinical detail/specificity	Each individual is assigned a number of numerical risk scores in different service categories
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Granularity and aggregation	For any individual, clinicians and healthcare managers can see the CRG (1,474) including severity level, the base CRG (392), Health Status Group. Three levels of aggregation, are available	Each individual is assigned multiple ADGs (32) and through statistical modelling methods is assign an ACG (110); regressive statistical models assign the numerical risk score.	Only the numerical (percentage) risk scores. Flags indicate the number of condition drivers. etc.
Transparency	Methodology Overview is publicly available. ¹⁸ Online Definitions Manual allows licensees to see extensive detail on CRG assignment	Proprietary logic with little transparency into what drives the risk score	Proprietary logic with little transparency into what drives the risk score
Stability—relative weights	Because a categorical approach is used, the model can remain stable while relative weights can be recalculated separately for different populations or benefit plans. ¹⁹ Recalculation is relatively straightforward and may be done without involving the methodology developers	Because a regression approach is used, the model must be re-specified for different populations or benefit plans, typically requiring involvement of the methodology developers.	Because a regression approach is used, the model must be re-done for different populations or benefit plans, typically requiring involvement of the methodology developers.
Stability – logic enhancements	Because a categorical approach is used, parts of the model can typically be enhanced without changing the rest of the model	Because a regression approach is used, enhancements typically require re-specification of the entire model	Because a regression approach is used, enhancements typically require re-specification of the entire model
International code mapping	3M is a world leader in mapping diagnosis and procedure code sets across countries. CRGs are explicitly designed for international use.	ACGs are used outside the U.S., implying capability in international code mapping	No information available

Clinical Risk Groups: Selected Bibliography

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Notes

¹ See, for example, a similar evaluation in Canada. Berlinguet M, Preyra C, Dean S. Comparing the Value of Three Main Diagnostic Based Risk Adjustment Systems. Ottawa: ON: Canadian Health Services Research Foundation, 2005.

² Hileman G, Steele S. Accuracy of Claims-Based Risk Scoring Models. Schaumburg, IL: Society of Actuaries, 2016.

³ The R^2 is derived from measurement of variance. If a single patient with expected expense of \$10,000 has actual expense of \$1 million (not inconceivable in healthcare), the effect is to increase variance by \$980 billion (i.e., \$990,000²).

⁴ Quinn K. After the revolution: DRGs at age 30. Ann Intern Med. 2014;160:426-429.

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- Fuller RL, Hughes JS, Goldfield NI. Adjusting population risk for functional health status. Popul Health Manage. 2016;19(2):136-144.
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⁹ Berry J, Hall M, Hall DE, Kuo DZ, Cohen E, Agrawal R, Mandl KD, Clifton H, Neff J. Inpatient growth and resource use in 28 children's hospitals. JAMA Pediatrics. 2013;167(2):170-177.

¹⁰ See the bibliography, Section C.

¹¹ See the bibliography, Section D.

¹² See the bibliography, Section E.

¹³ Millwee B, Goldfield N, Turnipseed J. Achieving improved outcomes through value-based purchasing in one state. Am J Med Qual. 2018;33(2):162-171.

¹⁴ www.3m.com/his/methodologies, then follow the link in the methodologies table to the subpage for 3M Patient-focused Episodes.

¹⁵ www.3m.com/his/methodologies, then follow the link in the methodologies table to the subpage for 3M Patient-focused Episodes.

¹⁶ As noted by the U.S. federal government, the separation of the methodologies for developing the clinical model and the payment weights a critical factor in the success and widespread adoption of Diagnosis Related Groups was a critical factor in the success and widespread adoption of diagnosis-related groups. Federal Register, May 4, 2001

¹⁷ Specific counts shown in this document are for the concurrent CRG model. Counts for the prospective CRG model differ slightly.

¹⁸ www.3m.com/his/methodologies, then follow the link in the methodologies table to the subpage for 3M Clinical Risk Groups. The Methodology Review is among the references listed at the bottom of the page.

¹⁹ Fuller RL, Averill RF, Muldoon JH, Hughes JS. Comparison of the properties of regression and categorical risk-adjustment models. J Ambul Care Manage. 2016;39(2):157-165.