Mitigating Risk in a State Health Insurance Exchange

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This spring, as the Patient Protection and Affordable Care Act (ACA) celebrated its first birthday, Massachusetts commemorated five years implementing and operating the Commonwealth's 2006 health reform law. Marking these milestones, the Blue Cross Blue Shield of Massachusetts Foundation, the Robert Wood Johnson Foundation, and the Commonwealth Health Insurance Connector Authority developed the *Health Reform Toolkit Series* to offer insight on key health reform topics to state leaders in the process of ACA implementation.
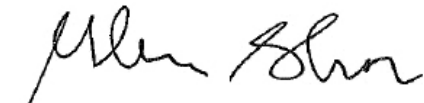
The *Health Reform Toolkit Series* is designed to share examples, templates, experiences, and lessons learned from Massachusetts' implementation of health reform to help other states plan, build, and implement elements of ACA. Each toolkit includes a written narrative "guide" as well as a variety of primary source documents: organizational structures, job descriptions, requests for proposals and quotations, and other work products from Massachusetts' health reform implementation experience. In particular, this toolkit offers ideas and resources to help states plan and implement a successful risk mitigation strategy for the state's health exchange.

We hope these toolkits are useful resources for a variety of health reform stakeholders, and we welcome your feedback. If you have thoughts on ways we can enhance the series, please contact the Blue Cross Blue Shield of Massachusetts Foundation at policy@bcbsmafoundation.org. If you would like more information from the Commonwealth Health Insurance Connector Authority on a particular implementation topic, please contact its Public Information Unit (Connector@state.ma.us).
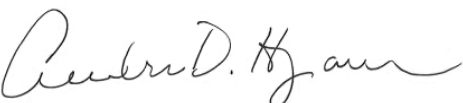
Sincerely,

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Acknowledgments

About the Toolkit Series

The 2010 national health reform law, known as the Patient Protection and Affordable Care Act (ACA), expands health insurance coverage to an estimated 32 million uninsured Americans. Much of the ACA's implementation occurs at the state level, where states will provide small businesses and individuals with a range of private and public health insurance options, as well as subsidies for consumers who cannot afford health insurance.

A key component of the ACA is the requirement that each state either develops or participates in a **health insurance exchange (exchange)**. An exchange is a kind of virtual marketplace through which individuals and small businesses can shop for and purchase health insurance. Under the ACA, state health insurance exchanges must be available for use by consumers to purchase health insurance with an effective date no later than January 1, 2014. In drafting the ACA, Congress drew heavily from the successful state health reform initiative adopted in 2006 by Massachusetts. (See Massachusetts health reform law.) Over the course of Massachusetts' planning and implementation efforts, state officials and administrators encountered many of the issues, challenges, and opportunities that are currently facing states in implementing national health reform.

This toolkit is part of a series designed to share examples, templates, experiences, and lessons learned from Massachusetts' implementation of health reform with other states beginning their own health reform planning efforts. You can find this toolkit and others in the series online at www.bluecrossfoundation.org.

Focus of this Toolkit

The ACA includes three key strategies intended to mitigate adverse selection and stabilize health insurance premiums when insurance market reforms are implemented in 2014.[1] These strategies are also designed to decrease health insurance plans' economic incentives to employ tactics designed to enroll healthier persons. These three risk mitigation strategies, described in more detail below, include:

1. Risk corridors;
2. Reinsurance; and
3. Risk adjustment.

By mitigating risk to health insurers, these three strategies – along with standardized product designs – work together to allow issuers to compete on quality, efficiency, and value, rather than on the basis of designing products intended to attract and enroll only the healthiest individuals.

These three strategies are very similar to the risk mitigation strategies implemented by the Commonwealth Health Insurance Connector Authority (Connector) in the subsidized Commonwealth Care program in Massachusetts. Although the scope and scale of the implementation will be much greater and more complex under ACA than it was in Commonwealth Care, lessons from the Massachusetts experience may be beneficial to other states as they begin to plan their own implementation.

This Toolkit Guide 1) describes the process used by the Connector to develop its risk mitigation program for Commonwealth Care, and 2) highlights key lessons learned in implementing Commonwealth Care and their relevance

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1   Patient Protection and Affordable Care Act, Title I, Part II, Subtitle D, Part V – Reinsurance and Risk Adjustment.

to other states implementing the ACA. Even if the process and steps described in this Toolkit Guide do not apply directly to your state, the examples and work products attached as appendices provide useful resources that can be modified or adapted to support your state's approach.

Why is Risk Mitigation Important?

Because health care costs are heavily concentrated in a relatively small share of the population, health insurer financial performance can often be more heavily impacted by the mix of patients they enroll than by the scope of benefits, cost efficiency, or quality of care they provide. In general, those carriers that attract a disproportionate share of costly individuals will be penalized, while those who manage to attract healthier individuals are more profitable.

The potential for adverse or anti-selection is particularly acute in the non-group (individual) insurance market, in which individuals make purchasing decisions based on their own health needs rather than on their affiliation with an employer group. To address this issue, insurers in a number of markets have traditionally used underwriting practices to set prices differently for individuals they perceive to have different health risks, or refused to cover individuals due to known health risks.

Under the ACA, beginning in 2014, underwriting and pre-existing condition exclusions are no longer allowed. For carriers not accustomed to operating in this type of "guaranteed issue," regulated insurance market, prohibiting these risk-mitigation strategies raises the possibility that they will attract a disproportionate share of more costly patients. While this is of obvious concern to health carriers, who may seek alternative means to attract a more favorable risk pool, it also raises systemic issues by potentially destabilizing the market, influencing pricing and affordability decisions, or encouraging plans to leave the market.

Risk Mitigation and the Patient Care and Affordable Coverage Act

As noted above, the ACA uses three primary tools to mitigate risk selection for health insurance issuers:

1. **Risk Corridors** (Sec. 1342). The ACA creates a temporary, federally administered risk corridor program that will be in effect from 2014 through 2016 for qualified health plans (QHPs) sold through health insurance exchanges. This program will pay issuers of QHPs offered through the exchange a portion of their medical costs that exceed 103% of the target amount. Conversely, the program will collect payments from issuers of QHPs whose medical costs are below 97% of the target amount.

   Establishing risk corridors is the broadest of the three tools. It is applied at the total medical cost level and protects the issuer from overall adverse experience, while also protecting the market from overly conservative pricing decisions by issuers.

2. **Reinsurance** (Sec. 1341). The ACA requires each state to implement a transitional reinsurance program that will operate for three years, from 2014 through 2016, under regulations issued by the U.S. Department of Health and Human Services (HHS). Health insurance carriers and third-party administrators will be required to pay into a $25 billion reinsurance fund, which will be used to make payments to issuers that cover moderately high-cost individuals in the non-group market. HHS will specify levels of coinsurance, the point at which reinsurance will be provided to compensate for losses (attachment point), and the point at which claims will not be eligible for reinsurance recoveries (reinsurance cap).

Reinsurance protects issuers who enroll a large number of moderately high-cost individuals. Reinsurance is applied at the individual level, but is generally employed based on overall medical cost for an individual. For example, if a member's total cost in a given 12-month period is $50,000 greater than the attachment point and the coinsurance amount is 75%, the carrier will receive a payment of $37,500 ($50,000 x .75) from the pool to defray the cost of that member.

3. **Risk Adjustment** (Sec. 1343). The ACA requires HHS and states to establish a permanent, ongoing risk adjustment system for health plans in the small and non-group markets. Under this program, each state is required to 1) assess a charge on health insurance issuers if their enrollees are measurably healthier than average and 2) provide a payment to health insurance issuers if their enrollees are measurably sicker than average.

   Risk adjustment techniques come in a variety of forms. Some use the age and sex of enrolled members to predict the overall risk of the population and to adjust premiums accordingly; others rely on more detailed, diagnosis and/or pharmacy-based claims data to ascribe individuals and health plans a "risk score" intended to measure the entities' risk relative to a benchmark or average. In general, the goal is to ensure adequate premium levels, or move money from health plans with more favorable risk to compensate those with less favorable risk.

Risk corridors protect against actual costs of products offered in the exchange being significantly higher or lower than expected. Reinsurance protects against a disproportionate share of higher cost individuals, although the ACA is somewhat different than traditional reinsurance which is generally employed to protect against the highest cost individuals (ACA reinsurance attachments points are expected to be lower than traditional). Risk adjustment is a tool to correct for risk selection by adjusting premiums (or payment) to health plans based on differences in expected costs due to differences in measured morbidity. Risk adjustment protects health plans (and other risk-bearing entities) that enroll sicker individuals and removes incentives for health plans to enroll only healthy individuals. It is essential in markets where underwriting is not allowed and will help protect the state's health exchange from anti-selection.

All three strategies – risk corridors, reinsurance, and risk adjustment – are designed to measure risk selection and lessen the financial exposure of health insurance issuers from greater than average risk. Since the ACA establishes specific requirements for risk corridors and reinsurance in the initial establishment of state health exchanges, the majority of this Toolkit Guide will focus on Sec. 1343 – risk adjustment strategies.

Fundamentally, risk mitigation strategies are designed to address core concerns related to risk selection, market stability, and carrier uncertainty.

Applicability of the Massachusetts Experience

The context for the risk mitigation program in Massachusetts discussed below differs in important ways from the context in which a risk mitigation program must be applied under the ACA, but is still highly relevant as a point of comparison.

Commonwealth Care is a publicly subsidized program for low-income adults administered by the Commonwealth Health Insurance Connector Authority. It is a "closed-end risk pool," which means that only individuals deemed eligible by the state can enroll. The state pays participating health plans a prospective, per-member per-month (PMPM) capitation rate for the members they cover, which is established during an annual procurement process managed by the Connector. Plan designs are uniform across all carriers and are set by the state. This type of a closed market program represents a classic context for risk adjustment: the sole payer, in this case the state, exerts a degree of control over the total average payment rate for the pool and is able to risk adjust payments across health plans while maintaining budget neutrality for the pool as a whole.

In contrast, the ACA requires states to adjust premium levels for plans in the commercial market, an "open-end risk pool" in which anyone can enroll, prices are set by carriers, not the state, and benefit designs could differ significantly within the market and across carriers. (Design differences will be mitigated to a large extent by the ACA with the introduction of actuarial value tiers for products sold in the exchange; however, there is still the opportunity for carriers to risk select based on benefit designs.) Thus, risk adjustment under the ACA involves a level of scale and complexity that is far greater than the programs introduced in Massachusetts.

Fundamentally, however, risk mitigation strategies in both contexts are designed to address the same core concerns related to risk selection, market stability, and carrier uncertainty. In both contexts, they share the goal of neutralizing the impact of risk selection so that carriers can compete on the basis of health plan value rather than population health. In both cases, a new market was formed and both state regulators and participating carriers faced a high degree of uncertainty, compounded by a lack of information on the new population with which to set prices. And in both cases, the strategies are designed to mitigate the same risks to program success: market instability, lack of carrier participation (especially in the early days of the exchange), and inadequate choice and access for members.

Coordination with the Medicaid Program Benefited the Exchange.

The oversight and administration of risk mitigation strategies were performed by a staff of three within the finance department of the Connector and overseen by the Connector's Chief Financial Officer. (See Chief Financial Officer Job Description.) These functions included the calculation, re-calculation, and payment of composite capitation rates; the collection and verification of stop-loss claims; and validation of recoveries, financial and claims analysis, risk settlement administration, and managed care organization (MCO) reporting. For certain functions, such as the development of actuarially sound base rates and calculation and pricing of stop-loss premiums and attachment points, the Connector engaged an outside consulting actuary.

Much of the underlying data collection and storage infrastructure necessary for the administration of the programs was provided to the Connector under an inter-agency agreement with MassHealth, the state's Medicaid agency. Due to the very short implementation time to establish Commonwealth Care and a desire of the Connector to limit the scale and cost of the organization, the Connector leveraged existing MassHealth infrastructure and the eligibility, enrollment, and encounter claims data specifications and submission procedures already in place between the Executive Office of Health and Human Services, which oversees MassHealth, and participating MCOs. This claims and enrollment database not only provided the necessary dataset for the implementation of risk adjustment, but allowed the tracking of individual enrollees across MCOs. The Connector also leveraged existing plan financial reporting templates and requirements to facilitate and streamline MCO reporting. Having these data and processes readily accessible not only helped the Connector retain a smaller cost structure, it also facilitated the transition to more sophisticated diagnostic-based risk adjustment in a time-efficient fashion.

The Massachusetts Experience

Commonwealth Care, a subsidized program for adult individuals at or below 300% of the federal poverty level who are not eligible for Medicaid or employer-sponsored insurance, was created in 2006 as part of Massachusetts' health reform law and is managed by the Connector. Individuals enrolled in Commonwealth Care are covered by private Medicaid managed care organizations, which are pre-paid a per-member per-month capitation amount for each enrollee. Individual enrollees contribute a portion of the cost of coverage, based on a progressive sliding scale contribution schedule established by the Connector. There is no premium for the lowest-income enrollees.

Because Massachusetts had the ability to actively purchase health insurance through a competitive bid process for the Commonwealth Care program, the Connector had to balance the needs of program sustainability, consumer choice, and access to care with the desire to maximize efficiency and control costs (to the state and higher-income enrollees).

To achieve that end, the Connector strategically deployed risk mitigation strategies to address the potential for adverse selection across MCOs, as well as to mitigate the uncertainty and potential for volatility during membership ramp-up. Unmanaged risk selection could eventually limit MCO participation on the one hand, while, on the other hand, high levels of uncertainty would lead to conservatism on the part of the MCOs that could result in excessively high bids. Further, structuring the program to address and control for volatility and uncertainty also protected the state against overpayment in the event that the enrolled population turned out to be less demographically risky than anticipated. Finally, all programs were premised on the idea that the state, which managed the entire risk pool, was better positioned to help smooth out potential volatility than the individual MCOs, who managed much smaller pieces of the same pool. By employing this larger risk pool concept, the Connector reasoned that taking an active role in managing MCO risk could result in both greater MCO participation and lower overall program costs. This larger risk pool concept underlies the risk adjustment provisions of the ACA.

Comparison of Massachusetts and ACA Risk Mitigation Program

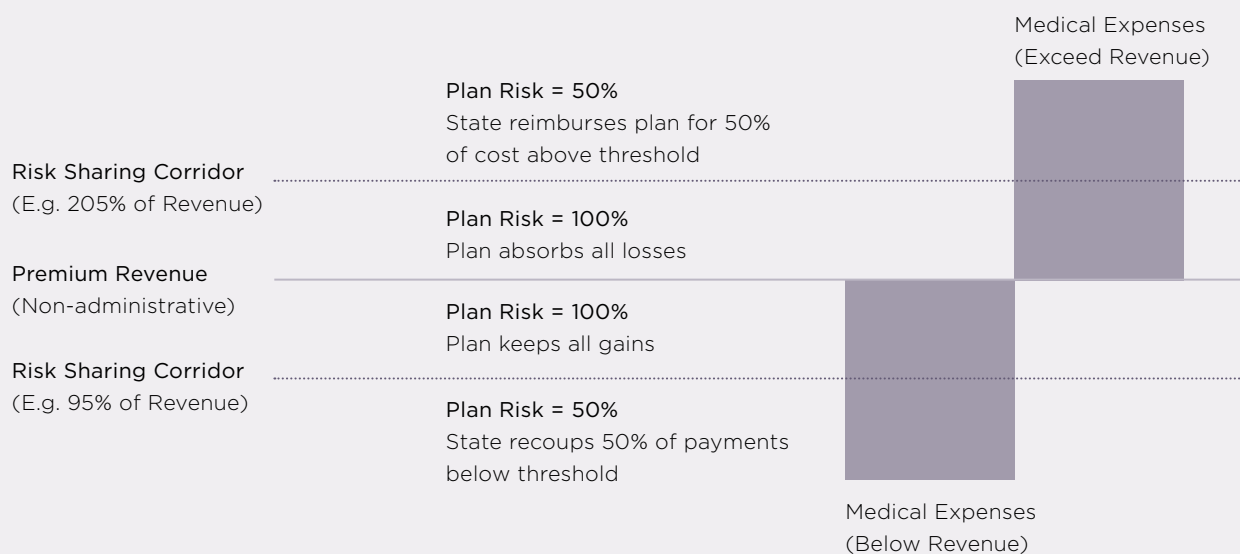| HEALTH PLAN PERFORMANCE DRIVERS	COMMONWEALTH CARE RISK ADJUSTMENT STRATEGIES	ACA RISK ADJUSTMENT STRATEGIES
Risk selection not measured by risk adjustment tool; population uncertainty	Aggregate Risk Sharing	Temporary Risk Corridors
Disproportionate share of high-cost individuals	Carrier-funded Stop-Loss Reinsurance Pool	Carrier-funded Transitional Reinsurance Fund
Measurable differences in population health risk	Risk Adjusted Capitation Revenue	Risk Adjusted Premium Revenue
Other performance factors (provider contracts, utilization management, benefit design)	*If the selection dynamics above are successfully addressed, residual health plan performance should reflect health plan value.*	

To address the concerns outlined above, the Connector constructed three risk mitigation tools that closely parallel provisions in the ACA: 1) aggregate risk sharing, 2) stop-loss reinsurance, and 3) risk-adjusted payments (initially based on age/gender demographics). Each of these strategies has their analog under the ACA in 1) risk corridors, 2) reinsurance, and 3) risk adjustment, respectively.

Massachusetts' approach to implementing these risk mitigation strategies and tools is described in more detail below.

1. **Aggregate Risk Sharing.** Massachusetts implemented an aggregate risk sharing program that is designed to make payments to or collect money from insurance carriers in the event that actual claims experience is materially different than expected. Under this arrangement, the state agrees to share risk with the health plan outside of certain corridors around the health plan's actual revenue. For example, in the first year, the state agreed to pay the health plan 50% of any costs incurred above 5% of the health plan's capitation revenue. Conversely, the health plan agreed to pay the state the same percentage if costs were lower than 5% of actual capitation revenue. As used in Massachusetts, aggregate risk sharing is analogous to the risk corridors prescribed by the ACA.

    Aggregate risk sharing resulted in greater certainty for both health plans and the state in the event that the actual claims experience was significantly higher or lower than anticipated during the procurement process. This was of particular value early in the program, due to the high level of uncertainty surrounding the actual underlying medical expense of the population that would enroll in the program. Further, by actively managing and refining this risk sharing corridor, the state has been able to help manage through population changes and enrollment fluctuations while sustaining health plan participation and competitive rates.[2]

Massachusetts Aggregate Risk Sharing Model (First Year of Exchange)

Medical Expenses (Exceed Revenue)

Plan Risk = 50%
State reimburses plan for 50% of cost above threshold

Risk Sharing Corridor (E.g. 205% of Revenue)

Plan Risk = 100%
Plan absorbs all losses

Premium Revenue (Non-administrative)

Plan Risk = 100%
Plan keeps all gains

Risk Sharing Corridor (E.g. 95% of Revenue)

Plan Risk = 50%
State recoups 50% of payments below threshold

Medical Expenses (Below Revenue)

2   For example, during the first two years of operations Commonwealth Care membership grew to approximately 180,000 members but later contracted due to the loss of eligibility for certain legal immigrants who accounted for approximately 20% of the population.

> Aggregate risk sharing reduces health plan conservatism, lessening the likelihood that carriers will increase premiums to reflect risks associated with uncertainty.

more than $150,000 in a single contract year, the pool will reimburse the carrier for 75% of the costs in excess of $150,000. Contributions to the pool are calculated as a percent of premium, and all carriers are required to contribute the same percentage. The fund is self-balancing, which means that in the event contributions are greater than recoveries paid, the carriers receive a pro-rata payment until the fund balance is zero. In the event contributions are less than recoveries paid, carriers are charged their pro-rata share so that contributions are equal to recoveries paid.

As will be the case with the transitional reinsurance program contemplated in the ACA, this reinsurance mechanism results in moving funds from one health plan to another to account for the differential exposure to high-risk individuals experienced by certain carriers. In any given year, some plans receive more in recoveries than they pay into the pool, while others contribute more than they receive in recoveries. Unlike in Massachusetts, however, the funding for reinsurance is across the entire insurance market, including self-funded plans, while the applicability of the program is for the non-group market only. The effect is an explicit cross-subsidization for the non-group market. This provides health plans a higher degree of comfort operating in a new and uncertain market and dampens their incentive to actively avoid high-risk members.

3. **Risk Adjusted Payments.** Risk adjusted payments are intended to protect the MCOs participating in Commonwealth Care from attracting a higher than average health risk. They are analogous to risk adjustment in the ACA in that a diagnosis-based risk adjustment tool, or some other methodology more sophisticated than age/sex, will be employed to measure a carrier's acuity at the member level.

   For the first two years of Commonwealth Care, rates paid to MCOs were adjusted by age, gender, geography, and benefit design, which varied primarily on enrollee cost sharing in 50% increments of the federal poverty level. While less sophisticated than a diagnosis-based adjustment methodology, such a system ensured that plan payments would be adjusted to reflect the cost of their actual enrollees and that plans and the state would have reasonable certainty around revenue and payment expectations. Further, due to the time and data constraints, a more sophisticated, diagnosis-based method was not feasible, not least because the actual risk profile of the population that would become eligible for Commonwealth Care was unknown.

The Move to Diagnostic Risk Adjustment

In early 2008, when Commonwealth Care had been up and running for a little more than a year, the Connector elected to pursue a refinement in the risk-adjusted payment model that would incorporate diagnosis-based risk scores for implementation on July 1, 2009 for the fiscal year ending June 30, 2010. There were a number of reasons why the Connector elected to pursue this strategy. First, there were now sufficient claims data to explore the possibility of moving to diagnosis-based risk adjustment. Second, it had become apparent that a risk selection dynamic was occurring among MCOs with differentially higher- or lower-risk members, and that this dynamic was not fully mitigated by the current, demographics-based payment methodology. And third, the Connector was interested in refining other aspects of the payment model to rationalize pricing and procurement, and having a more refined risk adjustment model would facilitate that transition.

Specific Stop-Loss Reinsurance Illustration

	HEALTH PLAN A	HEALTH PLAN B	HEALTH PLAN C	TOTAL
Member Months ('000s)	1,000	500	325	1,825
Gross Premium (PMPM)	$325.00	$315.00	$305.00	$318.70
Stop-Loss Contribution (1.25%) (PMPM)	$4.06	$3.94	$3.81	$3.98
Net Premium (PMPM)	$320.94	$311.06	$301.19	$314.71
Stop-Loss Recoveries (PMPM)	$1.13	$7.88	$0.69	$2.90
Stop-Loss Pool Surplus Share (PMPM)	$1.11	$1.07	$1.04	$1.09
Net Gain/Loss on Stop-Loss Pool (PMPM)	$(1.83)	$5.01	$(2.08)	$-
TOTAL ADJUSTED PREMIUM (PMPM)	$323.17	$320.01	$302.92	$318.70
Stop-Loss Contribution ('000s)	$4,063	$1,969	$1,239	$7,270
High-Cost Individuals	10	35	2	47
Stop-Loss Recoveries ('000s)*	$1,125	$3,938	$225	$5,288
Stop-Loss Pool Surplus Share ('000s)	$1,108	$537	$338	$1,983
Net Gain/Loss on Stop-Loss Pool ('000s)	$(1,830)	$2,506	$(676)	$-

Numbers are for illustration purposes only and do not reflect actual experience. Reflects the program implemented in Massachusetts, not the one outlined in the ACA.

*Assumptions:
　Each high-cost individual incurs $300,000 in medical claims
　Stop-Loss threshold is $150,000
　Pool reimburses 75% of cost above threshold

In developing refinements to the payment model, the Connector established some overarching principles to help guide development of the process and to help frame key decisions during development and implementation, including: 1) establish credibility, 2) maintain transparency, 3) maximize feasibility, and 4) minimize volatility and uncertainty. The development and implementation of the new model fell into four stages:

1. Analysis
2. Model Selection and Methodology Design
3. Communication
4. Implementation and Assessment

These four stages are discussed in more detail below.

Analysis

The first step in developing the refined risk adjustment methodology was to perform an extensive analysis on Commonwealth Care claims and enrollment data in order to: 1) determine if there was a sufficient amount of quality data to support the adoption of diagnosis-based risk, 2) select a model that best captured and predicted the experience of Commonwealth Care members, and 3) develop a payment model that addressed some of the unique features of the Commonwealth Care population, such as the high rate of membership turnover and short enrollment duration for some members. (See Commonwealth Care Program Data Analysis and Risk Adjustment Model Selection Recommendation.)

Prior to beginning this analysis, the Connector did an assessment of available risk adjustment tools and selected a vendor to assist with the development of a risk adjustment methodology. The Connector chose to work with Boston-based DxCG (now Verisk Health), a provider of business intelligence and predictive modeling for the health care marketplace. The Connector chose to utilize DxCG's predictive modeling software—a proprietary risk adjustment tool—to develop member level risk scores because the tool was highly regarded in comparative studies of risk-assessment accuracy and was used and trusted by the majority of MCOs participating in Commonwealth Care, as well as by MassHealth, the Massachusetts Medicaid program. These factors supported the goals of transparency and credibility for the model. Further, the Connector sought a vendor that could assist in the development of the methodology rather than simply seeking a software purchase and, as DxCG was headquartered in Boston, selecting them facilitated the high level of collaboration required by the Connector. Due to the unique programmatic elements of the Commonwealth Care program, the Connector worked closely with DxCG consultants to select the correct model and to assist with the population analytics.

The Connector provided DxCG analysts with 12 months of Commonwealth Care claims data and asked them to perform statistical analyses on the quality of the data and to assess which currently available DxCG models best fit the Commonwealth Care population. In order to increase the transparency, and therefore the acceptance, of the new process, the Connector sought to use an "off the shelf" risk adjustment model that could be easily used and replicated by the participating MCOs. As a result, the analysis focused on whether existing models were sufficiently predictive of Commonwealth Care experience. This was an important issue because the Commonwealth Care population differed from the standard commercial, Medicaid, and Medicare populations for which risk adjustment tools have been created.

DxCG performed a number of analyses on the data and determined that it was of sufficient quality to use in diagnosis-based risk adjustment, and that the model that best fit the data was a commercial model. They also found that the models were not statistically stable for individuals with fewer than seven months of experience in the program and therefore advised against using risk scores generated by the software for these members. This was important because the Commonwealth Care population, similar to populations in the Medicaid program, experienced a high level of turnover, and approximately half of the population at any given time had fewer than seven months of enrollment and claims history. Based on these findings, the Connector, working closely with DxCG, made the design and implementation decisions outlined in the next section of this Toolkit Guide.

> Rather than simply purchasing software, the Connector sought a vendor that could assist in the development of the methodology.

Connector Risk Adjustment Implementation Timeline

2008

APR —	Acquire enrollment and claims data*
	04.08 – 05.08 Interview and select risk adjustment vendors and, if necessary, consultants
MAY —	
JUN —	
	06.08 Begin analytical work to assess population and quality of claims data
JUL —	07.08 – 08.08 Develop risk adjustment methodologies
AUG —	
SEP —	
	09.08 Perform simulation to test methodologies
OCT —	10.08 Begin communications with Board of Directors (BOD)
NOV —	11.08 – 12.08 Begin communications with MCOs. Develop implementation timeline including data refreshes and MCO payments
DEC —	12.08 Incorporate BOD and MCO feedback Incorporate risk adjustment methodology into procurement specifications (RFP)

2009

JAN —	
FEB —	
	02.09 Respond to MCO RFP questions
MAR —	03.09 Finalize MCO procurement
APR —	04.09 Commission independent audit of risk adjustment calculations, data queries, and methodology
MAY —	04.09 – 08.09 Develop operational infrastructure
JUN —	
JUL —	
AUG —	
SEP —	
	09.09 Calculate first quarter risk score (retroactive basis) and second quarter risk score (prospective basis)

* NOTE: This was already in place due to process previously established between MCOs and Executive Office of Health and Human Services.

Model Selection and Methodology Design

The Connector had a number of important design and implementation decisions to make about how the risk adjustment model would be deployed and blended in with the other elements of the payment mechanism. Some of these decisions, and other actions necessary for effective implementation, are described below:

1. **Select** Prospective **vs.** Concurrent Model**.** The Connector elected to use a prospective model for the following reasons: 1) the prospective model was consonant with the prospective payment methodology already used, which used past claims experience to predict future costs; 2) unlike concurrent models, which tend to be some-what more accurate but can often result in large payables at the end of the year, prospective payment models afford greater certainty in revenue and expenses for the state and MCOs, which at the time was important for the state budget; and 3) the prospective model's emphasis on chronic illness rather than acute episode was more in line with care management goals held jointly by the state and MCOs.

2. **Manage Member Turnover.** As previously mentioned, Commonwealth Care experienced a high level of enrollee turnover as individuals moved in and out of program eligibility. This meant that the model could only generate a credible risk score for approximately half of Commonwealth Care's members at any given time. There were a number of options for handling this issue: 1) extrapolating the risk score from a health plan's enrollees who had been enrolled for more than six months to those enrolled for a shorter period, 2) paying all enrollees enrolled for a shorter duration at the program average, or 3) blending the current demographic methodology with the diagnostic-based risk scores. The Connector elected to develop a parallel, age/gender-based risk adjustment factor to apply to individuals without enough experience for a diagnosis-based score. Because the population was roughly evenly split, this had an impact similar to that of blending age/gender- and diagnosis-based risk scores.

   The Connector chose this model for a number of reasons. First, due to the fluctuation in population experienced by different health plans, it did not seem appropriate at the time to impute the "long cohort" score to the "short cohort." Second, adjusting by age/gender provided a better approximation of risk than imputing or assuming the average. Finally, due to the uncertainty around what impact the change to only diagnosis-based scores would have on plan payments, blending age/gender- and diagnosis-based risk scores would dampen the impact of full-on diagnosis-based adjustment. This would provide a buffer to MCO payment volatility in the early period of adoption and provide the opportunity for further assessment and, if necessary, refinement of the model.

   Supporting both age/gender- and diagnosis-based risk scores required the development of a normalization process that would "scale" the diagnosis-based score (generated based on the commercial benchmark native to the DxCG model) to fit with the age/gender factors, which were developed based on Commonwealth Care specific experience.

> The Connector elected to develop a parallel, age/gender-based risk adjustment factor to apply to individuals without enough experience for a diagnosis-based score.

3. **Incorporate Other Risk Factors.** Prior to the adoption of diagnosis-based risk adjustment, Commonwealth Care payments were adjusted based on the geographic location of the member and the benefit design in which the member was enrolled (lower-income members have lower cost sharing than higher-income members). The Connector decided to continue incorporating these adjustment factors in the new methodology, meaning each member's risk score would be a function of their health risk (measured either by a diagnosis-based risk score or an age/gender-based risk score), their geographic location, and the benefit design in which they were enrolled. As part of the new methodology, the Connector moved away from a model that asked health plans to enter bids at the individual rate cell level to one that allowed health plans to enter a single bid that was adjusted based on the composition of their population. This simplified the bidding process and reduced the amount of strategic bidding and potential gamesmanship that could occur. (See Capitation Rate Adjustment Methodology – Contract Exhibit.)

4. **Maintain Budget Neutrality.** The goal of most risk adjustment programs is to maintain budget neutrality around an average rate while accounting for differences across participating health plans. The Connector's goal was similar; while a new base rate, or average capitation rate, was established each year to account for year-over-year cost and utilization differences for the Commonwealth Care population as a whole, the risk adjustment methodology was intended to account for differences in populations across health plans. Each quarter, a normalization calculation was performed to ensure the total average rate approximated the average rate con-templated in the budget.[3]

5. **Update Schedule.** Because the change to diagnosis-based risk adjustment took place while the Commonwealth Care program was still relatively new, the program continued to experience some fluctuation in the enrolled population, along with the underlying risk profile. As a result, the Connector chose to continue to update capitation rates every quarter to better match payment amounts to the risk profile of the enrolled population. This closely approximates the frequency of updates made in similar programs (such as Medicare Advantage or Medicare Part D), and was warranted based on the relatively new program as well as the high level of turnover observed.

Diagnosis-based Risk Score Calculation Illustration

	DIAGNOSIS-BASED SCORE	AGE/GENDER SCORE	GEOGRAPHIC SCORE	BENEFIT SCORE	TOTAL RISK SCORE
Individual A	1.04	NA	1.04	1.11	1.20
Individual B	1.12	NA	1.04	1.11	1.29
Individual C	0.95	NA	1.03	1.03	1.01
Individual D	NA	1.02	0.97	1.03	1.02
Individual E	NA	0.97	0.97	0.95	0.89
HEALTH PLAN TOTAL SCORE					1.08

Example assumes Individuals D and E have insufficient enrollment experience to assign a diagnosis-based risk score.
Total Risk Score ("Long Cohort") = Diagnosis-based Score * Geographic Score * Benefit Score
Total Risk Score ("Short Cohort") = Age/Gender Score * Geographic Score * Benefit Score
Health Plan Total Score = Average of Individual Total Risk Scores

To recalculate composite rates, the Connector used a rolling 12-month claims base to assign risk scores for the quarter in question. A critical element for the success of such an approach is ready and timely access to quality claims data, since consistency in measurement requires the ability to maintain a constant time lag between the 12-month claims base and the 3-month enrollment period.

6. **Conduct Simulations (or Dry Runs).** Prior to making final decisions on the model and methodology adopted, the Connector conducted a simulation (or dry run) using available data to test the level of volatility and scope of impact that could be expected when the system was adopted. This provided some certainty that the magnitude of funds moving between plans would be acceptable, and also provided the detailed information that would be necessary for communicating with health plans and the Connector Board of Directors about the new approach.

7. **Revisit Model as Needed.** The Connector knew that certain features of the model would need to be refined over time, as more experience and data became available, and committed to continual ongoing assessment and review to determine opportunities for improvement. Some of the elements that have been identified for potential refinement post-implementation are discussed below in Implementation and Next Steps.

Communication

Communication was a critical element of developing and implementing the diagnosis-based risk adjustment model. Based on experience, the Connector knew acceptance and understanding among participating health plans, as well as the Connector Board and other important stakeholders, would be necessary to successfully adopt and implement a new model. If the program was not viewed as credible, transparent, or fair, it could jeopardize the long-term sustainability of and good will built up around the program.

To address this concern, the Connector worked to make all aspects of the risk adjustment process as transparent as possible. This was true both in the way the program was structured, as well as in the process employed to introduce stakeholders to the effort.

Soon after the Connector finalized a methodology to be shared with carriers, staff presented the draft risk adjustment methodology to the Connector Board. (See Commonwealth Care Risk Adjusted Capitation Overview – PowerPoint to Connector Board.) Due to the range of understanding of risk adjustment concepts on the Connector Board, staff provided basic information about what risk adjustment is, how it is utilized, and why it is needed for Commonwealth Care. Once a general baseline of knowledge was established, staff explained the proposed methodology to be discussed with the MCOs and how the implementation of risk adjustment would impact them. This process step was especially important as it helped the Connector Board understand the selection issues emerging in the Commonwealth Care program and how they were impacting MCO financial performance. This communication step began in October 2008.

Following the Connector Board briefing, staff began meeting with the MCOs during the end of October and into November to discuss, at a conceptual level, and solicit feedback on the emerging methodologies being developed by the Connector. This was roughly eight months prior to the implementation date in July 2009. In addition to ongoing discussions with MCOs, the Connector sought to maximize understanding and transparency of the process, particularly in connection with the annual health plan procurement, which began in December 2008.

Specifically, the Connector sought to provide plans with all the information they would need to approximate the risk adjustment calculations (exact replications were not possible, as the MCOs did not have claims data for enrollees switching to their plan from another MCO). The Connector sought to ensure transparency in the process by:

- Selecting an off-the-shelf DxCG model that was already licensed by the health plans and indicating, in advance, the model selected. This allowed health plans to replicate risk adjustment calculations using their own data.

- Providing a detailed description of the risk adjustment methodology, along with all adjustment factors for age and gender, geography, and benefit design, prior to the procurement process.

- Conducting a simulation specific to each health plan based on current payments to demonstrate the potential impact of changing the method, as well as providing an example of how the calculation and normalization were to be conducted.

- Being available for ongoing meeting, conversation, and consultation to help encourage a clear understanding of the process.

Because of the complexity of the payment model, this communication process with the plans was (and is) ongoing. Continued communication and collaboration with health plans to ensure that everyone understands the process has helped foster acceptance of the process and provided useful feedback to the Connector for process and/or methodology improvements.

Partly as a result of these efforts at transparency, the Connector was able to develop and implement the new risk adjustment process in approximately six months. This rapid implementation created additional challenges, though; at least one of the MCOs felt that the speed at which the risk adjustment methodology was introduced did not allow for adequate analysis of the most appropriate predictive modeling tool for the Commonwealth Care population.

> "
> The Connector was very transparent in their explanation of the risk adjustment methodology. The predictive model, data, and methodology were explained in great detail.
>
> **Bob Jordan,** Chief Actuary, Neighborhood Health Plan

Implementation and Assessment

Some observations from the first two years of implementation include:

- Limiting the number of individuals assigned a diagnosis-based score dampened the measured differences between plans, meaning some residual risk differences were left unaddressed.

- Normalizing the impact of period-over-period changes in risk was a positive methodological attribute because the risk score was picking up excessive volatility not necessarily related to population cost and not normalizing would have resulted in over- or under-payment.

- Health plans still find some aspects difficult to understand and have sought even greater levels of transparency. The Connector is now providing more detailed member-level information in the development of the MCO-specific risk score. (See Audit and Review of Authority Risk Adjustment and Preventive Incentive Program Processes.)

Beginning July 1, 2011, the Connector made a number of refinements to the risk adjustment model based on the availability of additional data, MCO feedback, and an assessment of model performance to data. These refinements include:

1. **Model recalibration.** Now armed with three years of fully ramped-up enrollment, the Connector was able to recalibrate the risk adjustment model based on Commonwealth Care experience, rather than an external commercial benchmark population, as had previously been used. The Connector estimates that this will improve the predictive power of the model by more than 50 percent (from 11 percent R-square to 17 percent R-square).

2. **Increasing the share of enrollees assigned a diagnostic score.** Increased claims experience and recalibration provide the model more stability for members who have been enrolled for shorter periods of time. This is aided by the fact that the Connector employs a prospective model, which is more focused on chronic conditions than acute episodes. As a result, the Connector will be applying diagnosis-based risk scores to individuals with at least one month of experience in the program. This will expand the share of members being assigned a diagnosis-based score from 50 percent to approximately 80 percent. It is hoped that this will further improve the accuracy of risk adjustment.

3. **Sharing individual risk scores.** Based on MCO feedback, the Connector has started to provide MCOs with individual, member-level risk scores for their own members. This practice, which is currently in place for Medicare Advantage, will improve transparency and assist health plans with care management activities.

Implications for Other States Implementing the ACA

Although the risk adjustment requirements that states must implement under the ACA are on a scale much larger than that of Commonwealth Care, Massachusetts' experience offers several lessons that may be helpful for states currently implementing health care reform. These lessons include:

1. Robust claims and enrollment data are essential to developing and implementing an approach to risk adjustment. Developing detailed claims and enrollment specifications, a mechanism for collecting information from carriers, and the data storage infrastructure needed to store and analyze the information are critical first steps. States developing an all payer claims database (APCD) should look to leverage that project as part of their risk mitigation program implementation.

2. Conducting comprehensive analysis and methodological work is important prior to engaging the market or other stakeholders. Due to the tight timeframe for implementation, engagement with carriers and other stakeholders should be done only after the range of feasible or desirable options has been significantly narrowed down.

3. Engaging carriers early following development of a rough methodological perspective will spark important dialogue and facilitate acceptance of and support for the methodology. This way, when final regulations or specifications are developed, they will already have been vetted and understood by carriers.

4. Testing and simulations using real data and processes prior to turning on the model are critical to ensure, to the greatest extent possible, that the model works as intended.

5. Including adequate feedback loops, together with robust reporting and assessment capabilities, ensures ongoing program integrity.

6. Developing and implementing a risk adjustment methodology is a not a one-time event. Successfully managing these programs requires constant and ongoing evaluation and evolution. The models developed should not be viewed as static; they will need to be continually assessed and improved to meet the changing needs of the risk pool and the market. States need to consider this ongoing need when developing budgets and operational plans.

Conclusion

States implementing a risk mitigation program under the ACA will be confronting a number of design and analytical issues unique to its market. Therefore, design decisions, methodological approaches, and implementation plans should be tailored to such issues. However, as noted in this toolkit, robust analysis, carrier engagement, and an implementation plan that provides the necessary lead time to communicate with all stakeholders and to allow process and dialogue before the go-live date will significantly increase the ability of a state to successfully implement a critically important aspect of the Patient Protection and Affordable Care Act.

Background Sources for Understanding Risk Adjustment

B. F. Kominski, *Medicare's Use of Risk Adjustment* (National Health Policy Forum, August 2007), http://www.nhpf.org/library/background-papers/BP_RiskAdjustMedicare_08-21-07.pdf.

American Academy of Actuaries, *Risk Classification in the Voluntary Individual Health Insurance Market* (Washington, D.C.: American Academy of Actuaries, March 2009), http://www.actuary.org/pdf/health/risk_mar09.pdf.

M. A. Hall, "The Three Types of Reinsurance Created by Federal Health Reform," *Health Affairs,* June 2010 29(6):1168–72.

K. Baicker and W. H. Dow, "Risk Selection and Risk Adjustment: Improving Insurance in the Individual and Small Group Markets," *Inquiry,* Summer 2009 46(2):215–28.

R. Winkelman and S. Mehmud, *A Comparative Analysis of Claims-Based Tools For Health Risk Assessment* (Schaumburg, Il.: Society of Actuaries, 2007), http://www.soa.org/files/pdf/risk-assessmentc.pdf

Wakely Consulting Group, *Analysis of HHS Proposed Rules on Reinsurance, Risk Corridors and Risk Adjustment,* August 2011. http://www.rwjf.org/coverage/product.jsp?id=72682.

GLOSSARY OF TERMS

Adverse selection occurs when a health insurance carrier attracts members that demand more health care services than expected. As a consequence, their premium prices must increase to reflect the higher demand of their members, making the health insurance carrier less attractive to healthier members. (back to page 5)

Underwriting is an insurance term that refers to the use of medical or health status information in the evaluation of an applicant for coverage. As part of the underwriting process, health information may be used in making two related decisions: whether to offer or deny coverage and what premium rate to set for the policy. (back to page 5)

Pre-existing condition exclusions are implemented by insurance companies to deal with adverse selection by potential customers. A pre-existing condition is a risk with extant causes that is not readily compensated by standard, affordable insurance premiums. (back to page 5)

Guaranteed issue is a term used in health insurance to describe a situation where a policy is offered to all (or almost all, depending on local regulations) applicants, regardless of the health status of the applicant. Often this is the result of guaranteed issue statutes regarding how health insurance may be sold, or to provide a means for people with pre-existing conditions the ability to obtain health insurance of some kind. (back to page 5)

Actuarially sound base (premium) rates: Premium rates are actuarially sound if projected premiums provide for all reasonable, appropriate, and attainable costs, including health benefits, administrative expenses, and margin. (back to page 7)

Diagnosis-based risk adjustment methodologies use diagnostic information from claims/encounters to classify patients into clinically homogeneous groups based on expected need for resource utilization and to predict relative resource use. (back to page 10)

A **Prospective** risk adjustment model uses data on a member from a previous period to estimate the member's future expenses and to set health insurance premiums (or capitation rates) for a given population. (back to page 14)

A **Concurrent** risk adjustment model draws on member data collected in the current period to explain expenses in the same period. (back to page 14)

Normalization is the process of organizing data to minimize redundancy. In developing a member-level risk score, because age/gender and the DxCG scores were based on different populations, the Connector developed an additional calculation to blend the two different scores into one score to apply to the base capitation rate. (back to page 14)

Chief Financial Officer

Commonwealth Health Insurance Connector Authority

The Commonwealth Health Insurance Connector Authority (Health Connector), created by Chapter 58 of the Acts of 2006, is an independent public entity charged with implementing the Massachusetts health care reform legislation. The Health Connector's role is to facilitate the availability, choice and adoption of private, affordable health insurance plans to all individuals.

Reporting to the Executive Director, the CFO is responsible for management oversight and the strategic direction of the financial operation including negotiating financial contracts with managed care organizations. The Chief Financial Officer works directly with the Executive Director on key strategic initiatives. The Chief Financial Officer also works closely with the Chief Information Officer, the General Counsel, the Directors of Commonwealth Care and Commonwealth Choice, as well as other members of the senior management team, and the Connector Board, to develop and implement strategy for Connector programs.

Responsibilities Include:

- Lead the Commonwealth Care procurement process which includes negotiating financial terms of the MMCO contracts and pricing out benefits variations.
- Support the Connector Board in policy making, and presenting updates on a regular basis.
- Develop financial modeling for short and long-term strategic initiatives of the Connector.
- Develop annual programmatic budgets.

Other significant duties include:

- Collaborates with key personnel from other state agencies including the Executive Office for Administration and Finance, MassHealth, and the Executive Office of Health and Human Services, in policy and program development.
- Oversees day to day processes of the accounting department, which includes financial statement process, accounts payable, payroll, and annual audit.
- Works closely with actuaries to develop financial terms for the MMCO procurement.
- Provides financial oversight to the procurement of outside vendors for the Connector.
- Plays a key role on the Senior Team, ensuring that information is consistently shared with team members. Oversee the development of the Connector's policies and procedures as they relate to financial operations.
- Collaborates with other Senior Team members in developing the goals and objectives for the Connector.
- Supports Connector-wide strategic initiatives as needed.

Experience Required:

- Candidate must have a Bachelor's Degree with at least ten years of management experience. A Master's Degree in Public Administration, Business Administration, or equivalent strongly preferred.
- Must be familiar with health care systems, health insurance, and managed care, with significant knowledge of Massachusetts health care system and Chapter 58.
- Strong analytical skills are a must.
- Demonstrates the ability to work within a fast-paced, quickly evolving organization.

- Must be able to manage multiple, complex priorities and respond to changes effectively.
- Candidate must be a committed team player with exceptional interpersonal, problem-solving, and communications skills. Candidates must have demonstrated success in working with a wide range of stakeholders.
- Strong oral and written presentation skills, essential.

Salary:

Salary range is competitive; salary will be commensurate with experience.

Interested:

Send cover letter and resume to Connector-jobs@state.ma.us.

Commonwealth Care Program Data Analysis and Risk Adjustment Model Selection Recommendation

Prepared for the Commonwealth Health Insurance Connector Authority

by Urix/DxCG

September 23, 2008

Background

- *Commonwealth Health Insurance Connector Authority*

The Commonwealth Health Insurance Connector Authority (the Health Connector) is a body politic and corporate and a public instrumentality of The Commonwealth of Massachusetts (the Commonwealth). The Health Connector is established pursuant to Chapter 176Q of the Massachusetts General Laws (as amended from time to time, "c. 176Q" or the Connector Governing Act), as added by Section 101 of Chapter 58 of the Acts of 2006 (c. 58 or the Health Care Reform Act of 2006), and is an independent public entity not subject to the supervision and control of any other office, department, commission, board, bureau, agency or political subdivision of the Commonwealth.

The Health Connector is governed by a ten member public-private Board, comprised of four ex-officio members -- the Secretary of Administration and Finance, who serves as chair of the Board, the Director of Medicaid, the Executive Director of the Group Insurance Commission and the Commissioner of Insurance -- and six members of the public, three appointed by the Governor and three appointed by the Attorney General. Public sector members encompass a range of interests and expertise, including organized labor, employee health benefits, consumers, small business, actuarial science, and health economics.

The purpose of the Health Connector is to administer the Commonwealth health insurance programs, as set forth in the Health Care Reform Act of 2006, the main purpose of which is to facilitate the availability, choice and adoption of private health insurance plans to eligible individuals and groups as described in c. 176Q.

To meet this responsibility, the Health Connector administers a publicly subsidized health insurance program named Commonwealth Care, for individuals without access to employer-sponsored health insurance and with family income at or below 300% of the federal poverty level (FPL). The start date of enrollment in Commonwealth Care for individuals at or below 100% of the FPL was November 1, 2006 and for individuals above 100% but at or below 300% of the FPL, February 1, 2007.

In addition to the administration of government-subsidized health benefit plans for eligible low-income residents, the Health Connector must also facilitate the development and offering of affordable commercial health insurance products (without public subsidy), named Commonwealth Choice, to individuals and small groups. Eligible small groups include groups, any sole proprietorship, labor union, educational, professional, civic, trade, church, not-for-profit or social organization or firms, corporations, partnerships or associations actively engaged in business that on at least 50 percent of its working days during the preceding year employed at least one but not more than 50 employees. Commonwealth Choice began offering commercial health plans on May 1, 2007, for an effective date of coverage beginning July 1, 2007.

- *Commonwealth Care Program (CommCare)*

CommCare is designed to provide health insurance coverage to individuals who are uninsured and meet specific statutorily defined eligibility requirements. These requirements include:

- U.S. citizen/national, qualified alien, or alien with special status;
- resident of the Commonwealth for the previous six months;
- ineligible for any MassHealth program or for Medicare;
- age 19 or older;
- not offered health insurance coverage through an employer in the last six months for which he is eligible and for which the employer covers 20% of the annual premium cost for a family insurance plan or at least 33% of the cost for an individual insurance plan;
- not accepted a financial incentive from his employer to decline his ESI plan; and
- family income at or below 300% of the FPL.

In addition to these criteria, the Health Connector Board approved additional eligibility regulations in setting up the CommCare program. These guidelines specify that individuals eligible for TRICARE; the Massachusetts Fishermen's Partnership; Qualifying Student Health Insurance Programs (QSHIP); or the Massachusetts Division of Unemployment Assistance's Medical Security Program are not eligible for CommCare.

- *CommCare Plan Types and Cost-Sharing*

The health plans offered through the CommCare program provide comprehensive health insurance coverage comparable to, and typically more generous than, the most common employer-sponsored plans offered by employers in Massachusetts. All plans include coverage for inpatient services, outpatient services and preventive care services, inpatient and outpatient mental health and substance abuse services, and prescription drugs. For members earning up to 100% FPL, dental services are also covered.

The CommCare program is designed as a mixed model. More specifically, for those earning 100% of the FPL or less, the program resembles a Medicaid program since the cost sharing schedule for these enrollees is statutorily tied to MassHealth, the state Medicaid program. Also, by statute, enrollees in this income category do not pay a monthly premium. Conversely, the Health Connector developed the benefit package and cost-sharing schedule for those eligible for CommCare and earning between 100.1 – 300% of the FPL. In doing so, the Health Connector sought to incorporate a benefit package and co-payment structure more typical of commercial insurance.

Member premiums are progressive beginning at 150% of the FPL and increase in 50% increments. Additionally, cost sharing is lower for those members between 100 – 200% of the FPL in comparison to members earning between 200.1 – 300% of the FPL.

- *Selection of an appropriate risk adjustment methodology*

The Connector Authority is considering a risk adjusted capitation payment methodology for Fiscal Year 2010. To meet this timeline, the CCA retained Urix/DxCG in July 2008 to assist with risk adjustment model selection and provide consultative support to ensure that the chosen model is implemented correctly and in a manner consistent with the intended use of the output from Urix/DxCG risk adjustment models. Urix/DxCG has also documented that data quality and other issues that may impact the model's predictive accuracy have been addressed based on currently available program experience, and on new experience if warranted.

- *Urix/DxCG corporate background*

Founded in 1996 by Drs. Randall P. Ellis and Arlene S. Ash, both professors at Boston University and premier researchers in risk adjustment for health economics and healthcare services research, DxCG has become an industry leader in risk adjustment and predictive modeling for the healthcare, workers compensation and disability insurance industries. DxCG's risk adjustment methodology has been widely studied and remains the most publicly researched. In 2002 and 2007, the Society of Actuaries conducted separate comparative studies of prevalent risk adjustment tools in the United States, and both times found that DxCG's risk adjustment models are among the best in class. Please refer to Attachment F, "Discussion of Results from 2007 SOA Risk Adjustment Study, a DxCG White Paper" for more information on the 2007 SOA study results.

More than 350 customers in the United States and abroad use DxCG's risk adjustment and predictive models - the **Diagnostic Cost Group (DCG)** and **RxGroups**® models, to pay providers fairly, create health-based payments, identify opportunities for care management, and evaluate the efficiency of managed care programs to help deliver the best quality of care to their patients. Most notably, the DCG/HCC risk adjustment methodology is used by CMS to set program payment for Medicare Advantage plans. As part of their health care reform initiatives, the German Ministry of Health will also start using a German version of the DCG/HCC models in 2009 to allocate resource across different regional sickness funds. Locally, MassHealth and most of its contracting managed care organizations use DxCG's models and tools for budgeting, cost and utilization management, and disease management.

In 2004, DxCG was acquired by Insurance Services Office (ISO) of Jersey City, New Jersey, a leader in property and casualty insurance analytics. In 2006 DxCG combined forces with Urix, a long-time DxCG partner and health care business intelligence systems provider. The combined entity assumed Urix as the corporate name and DxCG became the science division of Urix. For more information, please refer to Attachment G, "Urix/DxCG corporate background".

Section 1. Executive Summary

The Commonwealth Care Program was initiated in November, 2006, and has experienced a rapid ramp up in enrollment. For FY 2010, the Connector Authority plans to implement a risk adjustment payment methodology and correspondingly initiate a bidding process with managed care organizations in January, 2009. This timeline required that that the risk adjustment methodology be finalized by September 2008. Under the software license agreement and master services agreement between the Connector Authority and Urix/DxCG, we received Commonwealth Care (CommCare) Program enrollment data for Calendar Year 2007, and medical and pharmacy claims incurred in Calendar Year 2007 and paid through March 31, 2008. We subsequently conducted a series of benchmarking exercises and statistical analyses to develop a model recommendation for implementation of risk adjustment in the CommCare Program. This document summarizes our study design and main findings on the CommCare program data to date, and the subsequent model selection recommendations based on that evidence.

The CommCare data extract contains member-level details on age, gender, months of eligible enrollment, plan type and medical claims. We conducted a set of data quality tests and found that the data is of good quality. The data was processed through Urix/DxCG's software product, RiskSmart Stand Alone (RSSA) Version 2.3.1. RSSA contains more than 90 risk adjustment models and each is optimized for a different business application for a particular population. The models are organized into three population types – Medicare, Medicaid and Commercial. Within Medicaid there are models calibrated to fee-for-service and managed care populations separately.

The DCG/HCC risk adjustment models use diagnostic and demographic information to form predictions (DCG risk scores) of healthcare resource use at the individual level. Specifically, the DCG/HCC models map the more than 16,000 ICD-9-CM diagnosis codes, from both inpatient and outpatient settings, into 184 condition categories (CCs). Each CC encompasses similar medical problems with similar expected costs. Individuals with multiple medical claims may have multiple CCs; those with no medical encounters have none. Clinical hierarchies identify the most costly manifestation of each distinct disease for each individual. The models not only create a comprehensive clinical profile for each individual, but also provide each individual's predicted year 1 or year 2 costs expressed in relative risk scores (RRS). A RRS of 1.00 represents the average cost/year for a person in the benchmark population. A score of 2.00 represents two times the average, and a score of 0.5 represents one-half of the average.

Based on professional experience, we selected two candidate models which would potentially be a good fit for the CommCare data – 1) a model developed for the commercially insured population, and 2) a model developed for the Medicaid managed care population. Based on a comparison of the CommCare data to the demographic composition, disease prevalence rates, and risk and cost distributions of the commercial and Medicaid managed care benchmarks, we conclude that the CommCare population most

closely resembles commercial experience. Through evaluation of widely accepted predictive performance measure such as R-Squared and predictive ratios, we conclude that the commercial model is also a better fit, statistically, to the CommCare population.

During our analysis, we considered each of the following dimensions, which drive model selection, as well as the intended application of the model.

- The population from which the development data was extracted to build the model (e.g., Commercial, Medicaid Managed Care, Medicare)
- Whether concurrent (Year 1) or prospective (Year 2) predictions are required for the specific application
- Whether top-coding of the dependent variable (health care costs) was applied in model development (e.g., at $100,000 or $250,000 thresholds), which is done to account for reinsurance arrangements that limit insurer risk for outlier expenses

In addition to the dimensions listed above, the analysis described below also took into account challenges presented by the unique nature of the CommCare program, including the newness of the program, the relatively short eligibility spans based on enrollment ramp-up, and the fact that there is no risk-adjustment model for the uninsured currently available in the market.

Based on our benchmarking and statistical analyses, we recommend a commercial, prospective risk adjustment model. The specific DxCG Risk Adjustment model recommended is Model 26, "Commercial All-Encounter Med+Rx Year 2".   This model utilizes inpatient and outpatient medical claims in year one to predict total (untopcoded) medical and prescription drug spending in year two. The demographics of the population used to develop this model most closely resemble the demographics of the CommCare population. A prospective model was chosen for the following two primary reasons:

1. Risk scores developed from claims data during the experience period will follow members during the rating period. Therefore, risk scores should represent the relative burden during the rating period, not the experience period.
2. When used to establish risk-adjusted capitation rate, concurrent models tend to compensate health plans for differences in the incidence of acute episodes, which may decrease incentives for health plans to minimize acute episodes.

Section 2. Introduction

Risk adjustment research started in the early 1980s and has become a standard methodology for setting fair program payments by accounting for whole-patient comorbidity. Since 2004, the Center for Medicare and Medicaid Services (CMS) has been using the DCG/HCC risk adjustment methodology to set program payment for the Medicare Advantage plans. In July 2008, the Commonwealth Health Insurance

Connector Authority (Connector Authority) retained Urix/DxCG, the original developer of the DCG/HCC methodology, to recommend a risk adjustment payment methodology for the Commonwealth Care Program (CommCare).

We received CommCare's enrollment data for Calendar Year 2007 and medical and pharmacy claims incurred in Calendar Year 2007 and paid through March 31, 2008, and conducted a series of data and statistical analyses. Included in these documents are our findings on data quality, demographic composition, disease prevalence, and risk and cost distribution. We have also documented the predictive accuracy of selected DCG/HCC risk adjustment models applied to the CommCare data. Based on the evidence, we have offered recommendations for which model to use in developing risk adjusted capitation rates, as well as caveats regarding data and credibility issues. It is not the intention of this document to characterize or make recommendations regarding the rate development process, or all aspects of the implementation of risk adjusted capitation by the Connector Authority. However, specific implementation issues related to model selection and risk adjustment are discussed to the extent these processes should be aligned.   This document is prepared for the Connector Authority for internal use only and is organized into five sections:

Section 1 – Executive Summary
Section 2 – Introduction
Section 3 – Urix/DxCG's Methodology and Approaches
Section 4 – Summary Statistics and Main Findings
Section 5 – Discussions

The following tables are enclosed at the end of the paper and they are:

Table 1 – Demographic Composition
Table 2 – PMPM Cost
Table 3a – ACC and HCC Prevalence Rates
Table 3b – Prevalence Rate Comparison Summary by Plan Type
Table 4a – Weighted and Unweighted Measures of Predictive Accuracy by Plan Type in the Concurrent Setting
Table 4b – Predictive Ratios by HCC in the Concurrent Setting
Table 4c – Predictive Ratios Summary
Table 4d – Risk Score Distribution in the Concurrent Setting
Table 5 – Predictive Accuracy by Eligible Months in the Concurrent Setting
Table 6 – Simulated Model Performance in the Prospective Setting

We have also included the following supporting attachments:

Attachment A - Commonwealth Care Monthly Enrollment and Budget Report for the Period July 2008.
Attachment B - DxCG Models and Methodologies Guide

Attachment C - DxCG's project reports to the AHRQ

Attachment D - MEPS documentation on risk adjustment scores as posted on AHRQ's website

Attachment E - RiskSmart Stand Alone 2.3.1 User Guide

Attachment F – Discussion of Results from 2007 SOA Risk Adjustment Study, a DxCG White Paper

Attachment G – Urix/DxCG corporate background

Section 3 – Urix/DxCG's Methodology and Approaches

- *DCG/HCC risk adjustment models*

The DCG/HCC risk adjustment models have been widely documented and used by health plans, employers and provider groups. Diagnostic Cost Group (DCG) and Hierarchical Condition Categories (HCCs) is a clinical classification system combined with a risk adjustment methodology. The HCC classification system is based on ICD-9-CM diagnosis codes collected from inpatient and/or outpatient claims. Each code is classified into one of 184 condition categories. Hierarchies are further imposed to make predictions more robust to variations in how disease codes are captured, to reward more accurate and detailed coding, and to increase model stability. Regression models are developed using large national samples to predict various outcomes in different timeframes for different purposes. Age, sex, HCCs and interaction terms are included in the models and each has a coefficient contributing to overall risk. The individual level prediction is a relative risk score, which is a summary of disease burden and expected annual healthcare resource use at the individual level. The score may be normalized to a specific population by dividing by this reference population's average score. The individual, normalized, scores can further be converted into dollar predictions by multiplying by an appropriate sample mean. For example, if a reference population has $2,000 mean costs, then multiplying the normalized relative risk score by $2,000 yields the dollar prediction for that individual. Please refer to Attachment B, "DxCG Models and Methodologies Guide" for more information.

CMS uses the same methodology but a subset of HCCs to perform risk adjustment for the Medicare Advantage program. We have also developed DCG/HCC risk adjustment models for the German government as part of their national health care reform initiatives. Similar to CMS, the German Ministry of Health will use the same methodology and a subset of HCCs to allocate money across different regional sickness funds depending on the demographic composition and disease burden of each region. DCG/HCC is also one of the risk adjustment methodologies endorsed by CMS for Medicaid managed care.

- *DxCG's prior related research experience*

As of now, there is no risk adjustment tool for the uninsured readily available in the marketplace primarily due to the lack of demographic data and claims experience for a demographic group that often does not have health insurance.

In 2005, the Agency for Healthcare Research and Quality (AHRQ) contracted with DxCG to incorporate risk adjustment scores into the Medical Expenditure Panel Survey (MEPS) data. The MEPS data set is created from an annual panel household survey conducted by the AHRQ on health care expenditures in the U.S. Each panel has about 10,000 individuals tracked over two consecutive years. To ensure representativeness, MEPS has a complex survey design, including stratification, clustering, multi-stage selection and disproportionate sampling. It is one of the most widely used research databases for health economists and health services researchers. MEPS surveys collect individual-level diagnostic information in the form of ICD-9-CM codes. In the past, the research community had struggled with aggregating scattered medical information and comorbidities to derive one single number that represents disease burden at the individual level. AHRQ's main objective was to incorporate a relative risk score from a DCG diagnosis-based risk adjustment model.

There are seventeen distinct insurance coverage types included in the MEPS panels. The major categories are Medicare, Medicaid, Medicare/Medicaid dual eligible, private insurance, and no insurance. There were people categorized by different insurance coverage types within the year as well. Working together with the AHRQ, we developed rules to assign people into four major categories – Medicare, Medicaid, private insurance and no insurance. Because there is no commercially available model for the uninsured, DxCG sought to determine which available model best fit this population. Between the Medicaid and commercial models, we assessed which one fit better for the uninsured and found that the commercial model was the best in terms of predictive accuracy. For more details please refer to Attachment C, DxCG's project reports to the AHRQ, as well as Attachment D, MEPS documentation on risk adjustment scores posted on the Agency's website.

A key feature in the MEPS data is that the respondent's medical problems are all fully documented for the survey years regardless of insurance status. This allowed us to construct a comprehensive view of disease burden at the individual level. In the case of CommCare, as discussed earlier, we only observe a portion of an individual's medical profile due to short eligibility and data security protocols preventing the use of prior claims experience with MassHealth. Although there is no guarantee of the same findings for the CommCare population, the same research methodology is transferrable, potentially contributing to high external face validity.

- *Two-step approach to recommending a prospective model in the absence of 24 months of data*

The question, "What prospective model fits best on the CommCare data", has two underlying questions – "What population does CommCare resemble most?", and "What prospective model has highest predictive accuracy?" Based on years of research experience and industry knowledge, we believe the first question is more fundamental and outweighs the second.

While 24 months of enrollment and claims data is optimal to compare model performance in a prospective setting, 12 months of data is statistically acceptable. In addition, we carried out the CommCare analyses in two steps. In the first step we compared CommCare's age/sex composition, disease prevalence rates, per member per month spending and other statistics to the model development benchmark datasets for our commercial and Medicaid managed care models. Second, we performed a set of model performance tests in the concurrent setting to evaluate which model has higher predictive power given the unique characteristics of the CommCare program and data structure. The results of this analysis should be sufficient to answer the first question, "What population does CommCare resemble most?"

Model 18, "Commercial All-Encounter Med+Rx Year 1", was originally designed to be used on a commercial population. It uses age, gender and diagnostic information from all sites of service (inpatient and outpatient) to predict the current year's cost at the individual level. The model was calibrated using 2004 and 2005 data from the Thomson Medstat Marketscan commercial research database. The Marketscan data is collected and maintained by Thomson and includes inpatient, outpatient and pharmacy claims for individuals enrolled in over 100 health plans contracting with large employers, state and local governments and public organizations in the United States. It includes fee-for-service claims, managed care claims and capitated health plan encounter data. It is considered one of the largest and most representative research databases.

Model 76, "Medicaid Managed Care All-Encounter Med+Rx Year 1", was originally designed for the Medicaid managed care population. It uses age, gender, eligibility duration and status, and diagnostic information from all sites of service to predict the current year's cost. We used managed care data for Fiscal Years 2002 through 2004 from MassHealth to calibrate this model and other Medicaid models. Although Medicaid fee-for-service models are also available, judging from the demographic mix, especially with regard to the high rate of disabled and blind members in the fee-for-service population, we decided not to include these models in the comparison.

For more information on these two models and the model development dataset, please refer to Attachment E, "RiskSmart Stand Alone 2.3.1 User Guide".

Individual R-Squared and predictive ratios are industry standard measures to evaluate predictive accuracy of risk adjustment models. Individual R-Squared statistics represent the percent of variability in cost that a model is able to predict or explain at the individual level. It is a number between 0 and 1. The higher the R-Squared, the more accurate is the model. In predicting an individual's total healthcare spending, risk adjustment models typically have an R-Squared value between 0.1 and 0.2. Predictive ratios are a group-level measure of predictive accuracy. They are calculated by dividing the predicted cost by the actual cost for a certain group such as an age/sex cell, or a grouping of individuals with the same HCC or disease definition. The closer to 1.0, the more accurate the model is for that group.

We compared individual R-Squared and predictive ratios for Model 18 and Model 76 by age/sex, by eligible months, and by HCC. Overall, we find that Model 18 has a better fit on the CommCare data for individuals with at least 7 or more months of eligibility.

Enrollees with less than seven months of data do not allow for a complete, stable picture of their health status. For these individuals, different risk adjustment approaches rely on different mechanisms for assigning relative risk. Some models use a pure age/gender factor (like the CMS Medicare Advantage approach). Other models exclude these individuals from risk adjustment calculations, which implicitly assign the average age/gender factor for members with 7 or more months of experience to those members with less than 7 months of experience.   Members with less than 7 months of experience are generally excluded from further discussion in this document as this is an issue for consideration during implementation.

In the second step, under the assumption that the same findings from the concurrent setting would hold in the prospective setting had there been 24 months of data available, we performed simulation studies to test Model 26's predictive power. Model 26, "Commercial All-Encounter Med+Rx Year 2", is the prospective counterpart of Model 18. It was developed using the same Marketscan data, using exactly the same input variables. Through random sampling, we created 100 age/sex comparable samples of 223,965 individuals from the 2005 and 2006 Marketscan research database. In both 2005 and 2006, there are more than 10 million individuals, large enough for carrying out simulation studies of this size. We computed R-Squared and predictive ratios by age/sex groups and by eligibility duration. The number 223,965 was chosen as sample size for sampling to resemble the projected 225,000 total membership in CommCare for Fiscal Year 2009.

We find that Model 26 has fairly robust performance across all age/sex groups. By eligible months in 2005 (base year or Year 1), we find that the model has good predictive accuracy for individuals with 7 months of eligibility or longer.

Details of the data analysis in both steps are summarized in the section below.

Section 4. Summary Statistics and Main Findings

- *Demographic Composition*

In Table 1 we compare CommCare's average age and age/sex distribution with our commercial and Medicaid managed care benchmarks. CommCare Plan Type I's average age is closer to Medicaid managed care. All other plan types have an average age closer to commercial. Because Plan Type I

constitutes 54.3% of total membership within CommCare, the overall average age is closer to Medicaid managed care.

Comparing gender split by different age buckets, we find that Plan Types I, IIA, and III are closer to commercial, and Plan Type IIB is closer to Medicaid managed care. Overall, the gender split is closer to commercial.

- *PMPM Cost*

In Table 2 we list the PMPM total cost and pharmacy cost on the CommCare data and provide the corresponding statistics on the commercial and Medicaid managed care benchmarks. We find that the percent of drug spending in the CommCare population is closer to the commercial benchmarks.

Please note that the dollars in this exhibit are not directly comparable as the benchmarks represent 2005 average annualized allowable claims costs, while the CommCare data is annualized 2007. Annualizing cost for members with partial year eligibility is common practice in risk adjustment research. The underlying assumption is that for the part of the year an individual was ineligible for coverage, the rate of healthcare consumption remained the same. It is a simple method for extrapolating data in an attempt to resolve the missing data issue. Although cost is easily annualized, diagnoses and utilization experience are not. Due to short eligibility in CommCare, annualizing cost may overstate the cost for certain members.

- *Prevalence rate by Hierarchical Condition Categories and Aggregated Condition Categories*

RiskSmart Stand Alone outputs a string of 184 binary indicators based on whether or not an individual has a particular medical condition defined as an HCC. Aggregated Condition Categories (ACCs) further organize the HCCs by etiology and body systems.

A set of standard reports grouped by a user-defined variable can be requested when running RiskSmart. The standard reports provide useful information on disease prevalence rates (rate per 10,000), demographic distribution, actual and predicted cost by risk cells. Different benchmarks will appear on the reports when different models are run. Table 3a consolidates Model 18 and Model 76 runs, comparing CommCare's HCC prevalence rates by plan type with commercial and Medicaid managed care benchmarks side-by-side. We also provided the prevalence rates from the age/sex and eligibility compatible samples created from the simulation step discussed in Section 2. Table 3b summarizes our findings by plan type. Overall we find that the CommCare population is closer in HCC and ACC prevalence to the commercially insured population. At the ACC level there are some exceptions, for CommCare as a whole, for which the prevalence rate is closer to the Medicaid population:

- o ACC002: Malignant Neoplasm
- o ACC003: Benign/In Situ/Uncertain Neoplasm
- o ACC006: Liver

o   ACC008: Musculoskeletal and Connective Tissue
o   ACC011: Substance Abuse

- *Concurrent model predictive accuracy comparisons*

As mentioned in Section 2, individual R-Squared and predictive ratios are industry standard measures on risk adjustment models' predictive accuracy. Both weighted and unweighted R-Squared and predictive ratios by plan type are provided in Table 4a. On the entire CommCare population, the commercial model has a higher R-Squared by 5 percentage points on a weighted basis, and 4 percentage points on an unweighted basis. In relative terms, the commercial model outperforms the Medicaid managed care model by 12.9% when weighted by eligibility, or by 11.2% if unweighted. The differences are statistically significant and meaningful. Table 4a breaks out the difference in predictive performance by Plan Type as well, and the commercial model outperforms the Medicaid managed care model across all plans.

Weighting by eligibility is a common technique in risk adjustment research and it is computed by dividing eligible months by 12. Individuals with full 12 months eligibility have full weight contributed toward the calculation of a certain statistic such as average cost or R-Squared. Those with less than 12 months of eligibility receive lower weights based on the fraction of the year enrolled. Weighted measures do not treat each observation (individual) equally which mitigates the impact of incorrect predictions based on partial eligible data. When calculating the weighted R-Squared statistic, the predicted outcome variable is annualized first. In the case of unweighted measures, all observations are treated equally, regardless of the period of time enrolled, and there is no annualizing of the partial year experience. Both measures provide valuable information. However, depending on the application, a user may prefer one over another.

We find that the commercial model has higher R-Squared, both weighted and unweighted, across all plan types. This is consistent with our prior research with the AHRQ using the MEPS data. Unweighted predictive ratios from the commercial model are also closer to 1.0 across all plan types. We did not compute the weighted predictive ratios because mathematically they are identical to the unweighted measures.

To examine how well the commercial and Medicaid managed care models do by medical conditions captured in our clinical hierarchies, we compared the predictive ratios by HCC. Details are provided in Table 4b with a summary of findings in Table 4c. We find that the commercial model does a better job in 76% of all 184 HCCs, and the Medicaid managed care model has better predictive ratios for 24% of the HCCs.

Although it might seem that the commercial model is "winning" the majority of HCCs, we still need to confirm that the better performance is not merely a reflection of predicting well for conditions that the commercial model is "familiar" with. A truly robust and superior model should be flexible and tolerant enough to predict well on external data generated in a different environment. To test this, we computed one more statistic, included in the lower part of Table 4c, the percent of HCCs for

which model has better predictive ratio *and* closer HCC prevalence rates. In this case, the commercial model "wins" 59% of HCCs, the Medicaid managed care model "wins" only 8%, and for the other 33% there was not one model that had both better predictive ratios *and* closer HCC prevalence rates.

- *Eligibility considerations in the concurrent setting*

To test which model predicts better for people with partial year eligibility in the concurrent setting, we computed the weighted and unweighted R-Squared statistics by eligible months. These results are included in Table 5. By months of eligibility for the CommCare population, the commercial model has a higher absolute R-Squared from between 1 to 8 percentage points, weighted or unweighted, depending on the number of eligible months. In relative R-Squared terms, the commercial model outperforms the Medicaid managed care model by 2.3% to 18.3%, depending on the number of eligible months. There is an upward trend in R-Squared with longer eligible months for both models.

Predictive ratios are not unanimously in favor of the commercial model. For members with at least 5 months of eligibility predictive ratios are very close between the two models. There are 43.3% members with eligibility of 4 months or less. The Medicaid managed care model has slightly better predictive ratios for this group, although both models under-predict by about 40 percent. There are 18.7% of members with 11 or 12 months of eligibility, and although the commercial model predicts better here, both models over-predict by around 23% to 35%. This is partly due to the fact that the under-prediction for members with fewer months of eligibility is balanced out by higher average risk scores for the 11 and 12 month cohorts, such that the average score is 1.00. This drives up the predictive ratios. We also note that the PMPM costs for members with 11 or 12 months of eligibility is significantly lower than the PMPMs for all other eligibility cohorts, except for those with 1 month of eligibility (actual PMPM by month of eligibility may be derived from Table 5). As expected, this drives up the predictive ratios for those with 11 or 12 months of eligibility.

- *Model recommendation*

Based on the goodness of fit analyses described in the above, we conclude here that the commercial model fits better on the CommCare population in the concurrent setting. According to the model selection principles laid out in Section 2, we recommend the corresponding commercial prospective model , Model 26, "Commercial All-Encounter Med+Rx Year 2" for risk adjustment on the CommCare population for Fiscal Year 2010.

- *Prospective simulation study and eligibility considerations*

In the absence of 24 months of data on CommCare, we created a random sampling routine to do repeated sampling against our last commercial research database. Starting with more than 10

million individuals for each years in 2005 and 2006, we created 100 random samples of 223,965 individuals with identical age/sex distribution and then calculated the R-squared and predictive ratios by age/sex and by eligible months. The results are presented in Table 6.

Similar to the concurrent setting, we find that Model 26 has fairly good and robust performance across all age/sex groups, with prospective R-Squared ranging from 0.10 to 0.18 and predictive ratios ranging from 0.92 to 1.00, with most very near to 1.00. By eligible months, however, there is a small divergence between the R-Squared and predictive ratios. The R-Squared values are quite stable for those with at least 3 months of eligibility, ranging from 0.13 to 0.17, but drop below 0.10 for individuals with 1 or 2 months of eligibility. Predictive ratios start to deteriorate rapidly at higher durations, dipping below 0.70 at 5 months. There seems to be a natural cutoff at 6 months where the prospective commercial model's predictive accuracy begins to deteriorate significantly.

Based on these empirical findings and standard industry practice, we recommend that members with less than 7 months of eligibility should not be risk adjusted based on the DCG/HCC model. Instead, the Connector Authority may consider substituting a purely demographic-based score. This approach is consistent with CMS' approach for Medicare Advantage risk adjustment. The demographic score will likely be based on calendar year 2007 claims data for the CommCare program, rather than outside sources. We will work with the Connector to ensure the integrity of the model regardless of which option is chosen, and to assist in the implementation of the age/sex risk score into the risk adjustment process.

Section 5. Discussions

- *General Caveats when implementing a risk adjustment methodology:*

Below are some general caveats with regard to implementing risk adjustment:

- o Data quality
- o Claims run-out
- o Coding precision and density

No one in the healthcare space has "perfect" data, although data quality has improved significantly over the years. RiskSmart Stand Alone performs a series of data quality checks prior to running the models and the key statistics are all output in the Data Quality Appendix. We have carefully reviewed the Data Quality Appendix from the CommCare data run and compared this with our commercial and Medicaid managed care benchmarks. Judging from experience, we believe the CommCare data has good quality and is consistent with CommCare program's demographic and

enrollment characteristics. Below, we discuss in general terms what data quality issues may affect a risk adjustment model's assessment of disease burden and predictions of healthcare risks and costs.

The most important issue with respect to data is that the data quality for each cohort of individuals be reasonably similar. If data quality is average for all health plans except for one that has poor data quality, then the health plan with poor data quality will be underpaid for their risk. This may be viewed as their fault and therefore, their problem. However, it is important to communicate the importance of data quality in driving health plan payment. A common data quality comparability problem is the presence of provider capitation. Where providers are paid a capitation rather than based on fee-for-service claims, underreporting of diagnoses often occurs. This will potentially contribute to data quality issues and result in some health plans being underpaid to the extent they have disproportionate amounts of capitation (all else being equal).

One common data quality problem is that required data elements are missing on certain individuals included in a model run. Depending on the purpose of the analyses and the particular model, different data elements may be required for generating a relative risk score at the individual level. Risk adjustment models for the commercial setting typically require individual's age, date of birth or year or birth, gender, and medical claims as input for generating the risk scores. In Medicaid risk adjustment, additional information is required, such as the basis for eligibility (e.g., disabled/blind) and eligible months. In the case of RiskSmart Stand Alone, individuals with missing age or gender will be output to a "Bad Person" file without a risk score. In the CommCare data run only one individual was output to the "Bad Person" file as having an invalid date of birth as 01/01/0001. For individuals with age and gender information but missing medical diagnosis or pharmacy information, risk adjustment models may underpredict. Please refer to Attachment E, "RiskSmart Stand Alone User Guide" for information on model requirements.

A high percentage of people with *no claims* is also another common data quality issue. In the commercial setting, we typically observe that around 30 percent of members have no diagnosis claims or no *valid* diagnosis claims in a 12-month period with full claims run-out. In the CommCare data run, 33.94% members did not have a matching diagnosis claims. This number is slightly higher than our commercial benchmarks because (1) the CommCare program is fairly new, and (2) only three months of claims run-out was included in the data used for this analysis. With longer claims run-out we might see additional claims incurred by members previously classified as having no claims. Based on the above, 33.94% was deemed acceptable and we proceeded with the analyses.

Coding precision, i.e., not having detailed and precise ICD-9-CM codes, is another common data problem. The DCG/HCC clinical classification system and risk adjustment models were designed to encourage detailed coding of medical problems and discourage coding practices for gaming purposes (See Attachment B, "DxCG Models and Methodologies Guide", Section 2-2). In the past, we have helped clients assess the impact of less detailed coding. For instance, in the aforementioned research study with the AHRQ, the MEPS data only had 3-digit ICD-9-CM diagnosis codes. We examined how this affected the assignment of HCCs at the individual level as well as the impact on the model's predictive accuracy (please refer to Attachment C for more information). Generally

speaking, less detailed coding leads to underestimation of the severity of a medical problem. For instance, in the ICD-9-CM code set, a "250"code is for *all diabetes* including both Type 1 and Type 2, and diabetes with complications. Not having any specific details, patients with different severity will be classified into the same group and predictions for the group as a whole will overestimate for patients with low severity and underestimate for those with high severity. In the MEPS study we observed a real but relatively small loss of predictive power for the whole sample and found that the predictive accuracy suffered most for high risk people.

To a certain extent, risk adjustment models are also sensitive to the total number of diagnosis codes for each individual. The DCG/HCC classification system outputs a string of 1/0 binary indicators of Yes/No an individual has a particular medical problem, regardless of when and how many times the problem had been noted, as long as it came from a valid source such as a physician (please refer to Attachment E, "RiskSmart Stand Alone User Guide" for details on the diagnosis source algorithms). All comorbidities are taken into account but depending on the hierarchy rules not all conditions will be flagged out. If more unique diagnoses were supplied from valid sources to the risk adjustment model, risk scores would increase slightly. To this extent, code creep will result a small increase in risk scores despite our best effort.

In 2004, DxCG conducted a longitudinal study to examine code creep and its impact on different risk adjustment models. We observed that the average number of diagnosis increased in the study period, 1998-2002, but started to taper off in 2001 and 2002. This was confirmed in longitudinal studies we conducted using more recent data. We found that about 4% of increase in risk scores from commercial models can be attributed to better and denser coding on an annual basis. This number is compatible with CMS's estimate of 5% annual increase due to code creep.

It should come as no surprise that when capitation payment is developed using diagnosis codes, health plans and providers will have strong incentive to improve coding to enhance their revenues. The Connector Authority should monitor code creep carefully, communicate with the managed care organizations about this, and prepare strategies to address this when implementing risk adjustment.

One last common data issue is not allowing enough run-out for the baseline claims experience. Very much like missing claims, this will likely lead to underestimation of disease burden and cost. Unlike missing claims, claims run-out is a choice balanced between the need to capture a comprehensive picture for the entire population and the need to act on the most recent information in real time. DxCG's commercial risk adjustment models were developed using claims with at least 12 months of run-out, and the Medicaid models were developed using data with 6 months of run-out. Most of our clients have been using a 3 to 6 months of run-out and have seen that their results are very well aligned with our benchmarks.

Different managed care organizations may be facing different data quality issues than discussed above, and as a result their risk adjusted capitation payments may be affected in different ways. When implementing risk adjustment, it is in everyone's best interest to be consistent with regard to addressing these data quality issues. We suggest that the Connector Authority communicate these

general caveats with the managed care organizations throughout the bidding and implementation process.

- *Newness of the CommCare program*

The CommCare program was initiated in November 2006. As of August 1st, 2008, when the first data extract was available from the Connector Authority, we had enrollment data from Calendar Year 2007 and medical and pharmacy claims incurred in Calendar Year 2007 and paid through March 31st, 2008. The program has experienced tremendous growth since the initial launch. Overall growth in membership has leveled off in more recent months.

It is possible that some of our findings may change when the program becomes more stable and more up-to-date data is available for analysis. It is possible to update all of our work at a later date, to validate the appropriateness of the model selected or identify material changes based on emerging experience. For example, in the first quarter of 2009, when 24 months of enrollment and claims are available on CommCare, we would be happy to do a follow-up study using an identical or modified framework. We suggest that emerging results should be monitored closely, so that the risk adjustment model may be adjusted as more data becomes available.

- *Short eligibility duration*

We observe that in Calendar Year 2007, 60% of members were eligible for 6 months or less. This is partly because CommCare is a newly established program. It is also reasonable to expect a "frictional period" for people who potentially qualify but require lead time to learn about the program before enrolling. Another reason for short eligibility is that eligibility status is subject to change based on the member's economic status as reviewed during the Connector Authority's redetermination process.

A common practice in risk adjustment is to collect an individual's claims from all sites of service (i.e., all encounters an individual might have had with healthcare providers) for a 12-month baseline period. This ensures that all medical problems and comorbidities may be properly classified and that model predictions are fair and adequate given a sufficiently long exposure period during which claims are tracked and coded by providers. Short eligibility duration per se is not necessarily an issue as long as claims from all possible sources are collected. In the case of the CommCare program, however, the Connector Authority only has access to a member's claims when he/she was eligible and enrolled in the CommCare program. The Connector Authority has some general knowledge of a member's status prior to joining CommCare, for example, whether or not the member was with MassHealth or the Uncompensated Care Pool. However, this information is not available on 32% of members (see Attachment A). From the model's perspective, the individual-level medical profile would be incomplete, and this is especially the case for those with even shorter eligibility periods.

- *Concurrent versus prospective model for risk adjustment*

  There are few precedents for which concurrent models have been chosen for risk adjustment. We are recommending a commercial, prospective risk adjustment model for the following two primary reasons:

  1. This population experiences a high level of turnover, suggesting that risk scores should follow members during the rating period to some degree. Therefore, risk scores should represent the relative burden during the rating period, not the experience period.
  2. Concurrent models tend to compensate health plans for differences in the incidence of acute episodes, which may decrease incentives for health plans to minimize acute episodes.

- *Topcoded versus untopcoded models, and the CommCare reinsurance pool*

  Because of the reinsurance pool for FY 2009, specific MCOs are only at risk for 25% of claims in excess of $150,000. The MCOs in aggregate are at risk for 75% of costs above $150,000. Because the risk adjustment process is intended to adjust for differences in risk between specific MCOs, the risk adjustment model selected would ideally reflect 25% of claims in excess of $150,000. However, such a model is not included within the 90 or so available in the RiskSmart Suite, and no topcoded models exist within the group of models that are most similar to the demographic and risk characteristics of the CommCare population. Consistency with the underlying population is a much more important consideration than consistency with the risk pooling considerations. Therefore, the model chosen is not topcoded.

- *Pooling across all plan types*

  In Calendar Year 2007, from a total of 183,549 unique individuals enrolled in the CommCare program, 54.2% were in Plan I, 36.7% were in Plans IIA and IIB combined, and 9.1% were in Plans III and IV. In Table 4d, the average concurrent risk scores are compared by plan type (Plans III & IV combined as III), including measures of dispersion, symmetry and "peakedness" (or density) around the averages.

  Standard deviation is the most common measure of statistical dispersion, measuring how widely spread the values are around the estimated population mean. A smaller standard deviation means that many data points are closer to the mean. Skewness is a measure of symmetry. The skewness is near zero for a symmetric data distribution. A negative skewness indicates that the data is skewed to the left or that the left tail is longer than the right tail. A positive skewness means that the data is skewed to the right or that the right tail is long relative to the left tail. Kurtosis is a measure of whether the data are peaked or flat relative to a normal distribution. Datasets with high kurtosis tend to have a distinct peak near the mean, decline rather rapidly, and have heavy tails. Datasets with low kurtosis tend to have a flat top near the mean rather than a sharp peak.

Normalizing concurrent risk scores to 1.0 within CommCare as a whole, we calculated the mean, standard deviation, skewness and kurtosis values by plan type. Overall, we find that for CommCare as a whole or by specific plan type, the average relative risk scores, dispersion, symmetry and peakedness values are fairly similar. In other words, the commercial model would fit the entire CommCare population, and each individual plan, equally well in a statistical sense.

Morbidity will vary by MCOs across all income groups and plan types. The Connector Authority's goal is to recognize variations in morbidity to fairly compensate health plans. Therefore, using the same risk adjustment model across all plan types will reduce health plans' incentives to select favorable risk. Based on statistical observations and implementation considerations, we recommend that a single risk adjustment model be used across all plan types.

- *New enrollees, partial eligibility and eligibility threshold for using a risk adjustment model*

The impact of partial eligibility on predictive accuracy has been discussed in Section 3. Based on empirical evidence, we recommend that members with less than 7 months of eligibility should not be risk adjusted with the DCG/HCC model. Instead, these members should likely be assigned a purely demographic score based on their age and gender. Other options exist. The age/gender approach is consistent with how CMS handles risk adjustment in the Medicare Advantage program.

Demographic & DxCG Factors for September through November 2008 Enrollment

plan_type	region	Sep - Nov '08 Member Months			Average Risk Score		
		Demographic	DxCG	Total	Demographic	DxCG	Total
I	bos	34,991	37,652	72,643	0.904	1.001	0.954
	cen	22,996	19,520	42,516	0.911	1.053	0.976
	nor	29,402	26,299	55,701	0.907	1.012	0.957
	sou	26,643	24,350	50,993	0.882	1.032	0.954
	wes	18,922	15,522	34,444	0.878	1.011	0.938
Plan Type I Total		132,954	123,343	256,297	0.898	1.019	0.956
II	bos	18,344	26,806	45,150	1.012	1.018	1.016
	cen	14,379	16,456	30,835	1.019	1.094	1.059
	nor	16,801	20,321	37,122	1.016	1.035	1.027
	sou	19,755	22,670	42,425	1.007	1.101	1.057
	wes	12,192	14,115	26,307	0.991	1.069	1.033
Plan Type II Total		81,471	100,368	181,839	1.010	1.060	1.037
III	bos	6,029	6,229	12,258	1.056	1.096	1.076
	cen	5,110	5,024	10,134	1.067	1.178	1.122
	nor	6,525	5,840	12,365	1.067	1.149	1.106
	sou	8,602	8,019	16,621	1.081	1.141	1.110
	wes	4,303	4,747	9,050	1.084	1.116	1.101
Plan Type III Total		30,569	29,859	60,428	1.071	1.135	1.103
Grand Total		**244,994**	**253,570**	**498,564**	**0.952**	**1.047**	**1.000**

Commonwealth Care
Risk Adjusted Capitation Overview

December 3, 2008

Agenda

- CCA Risk Adjustment Process
    - Predictive Software Selection
    - Model Selection
    - Implementation
- Comparison to Other Programs
- Example

Vendor/Grouper Selection

- DxCG chosen as predictive software
  - Well known, highly regarded, and familiar to Mass. Medicaid market

- Already used by Mass. Medicaid and most currently participating MCO's

- Studies highly regard predictive performance compared to other commercially available predictive software

3

SOA Study Results

Diagnoses Only Models

Offered Weights, w/out Prior Cost, 100k Truncation (Table IV.4)

Tool	R-Squared
ACG	20.8%
CDPS	17.6%
Clinical Risk Groups	19.3%
DxCG	22.3%

4

Model Selection

- ## CCA Process
  - Engaged senior research staff at DxCG to perform comprehensive analysis of available data to select appropriate model

- ## Key Decision Points
  - Prospective vs. Concurrent
  - Off the Shelf vs. CommCare Custom
  - Input Data →Medical, Pharmacy or Both
  - Commercial vs. Medicaid

Model Selection (Cont.)

- **Prospective Model**
  - Intended adjustment methodology (assigning individual scores in base period to predict risk in rate period) best aligns with prospective model

- **Off-the-Shelf Model**
  - Lack of 24 months of claims data precluded development of custom model
  - Easy for MCO's to model risk of their population
  - Revisit in future

- **Input Data – Medical Only**
  - Sets correct incentives
  - Based on underlying diseases as opposed to treatment
  - Off-label prescribing and other problems

- **Commercial Model**
  - DxCG analysis concluded that CommCare experience most similar to Commercial Models

6

Implementation

- **Prospective, Individual, Quarterly Updates**
  - Budget neutral
  - Members with 7 or more months of experience in base period receive claims based, DxCG risk score
  - Members with less than 7 months of experience receive age/gender risk score (this dampens impact of risk adjustment)
  - Risk scores by health plan are based on enrollment in rating period
  - 1st quarter risk score based on 1st quarter actual enrollment
  - 2nd through 4th quarter risk scores based on enrollment in prior quarter

- **No Phase-in**
  - Typically phased in
  - Not necessary because of high turnover and age/gender for 'shorter duration' enrollees

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MA Connector Risk Adjustment Compared to Other Programs

Government Program	Risk Adjustment System	Individual or Aggregate	Prospective or Concurrent	New Enrollees	Update Frequency (Risk Scores / Enrollment)
CommCare	**DxCG**	**Individual**	**Prospective**	**Age/Gender**	**Quarterly / Quarterly**
Medicare	DxCG	Individual	Prospective	Age/Gender	Semi-annual / Monthly
		STATE MEDICAID PROGRAMS			
Colorado	CDPS	Aggregate	Prospective	Plan average	Semi-annual / Not Applicable
Florida	Medicaid Rx / CDPS	Aggregate	Prospective	Plan average	Quarterly / Monthly
Maryland	ACG	Individual	Prospective	Age/Gender	None / Monthly
Massachusetts	DxCG				
Michigan	CDPS	Aggregate	Prospective		
Minnesota	ACG	Aggregate	Concurrent	Plan average	Quarterly / Not applicable
New Jersey	CDPS	Individual	Prospective	Plan average	Annual / Monthly
New York	CRG	Aggregate	Concurrent	Plan average	Annual / Not applicable
Ohio	CDPS	Aggregate	Prospective		
Oregon	CDPS	Aggregate	Concurrent	Plan average	Annual / Not applicable
Pennsylvania	CDPS	Aggregate	Concurrent		Semi-annual / Semi-annual
Tennessee	ACG	Individual	Prospective	Plan average	Monthly / Monthly
Utah	CDPS	Aggregate	Concurrent		

Relative Risk Score Example

Numbers Are Illustrative For Discussion Only

Base Period Experience (From All MCO's)

	Age/Sex Factor	DxCG Factor	Geo Factor	Benefit Factor	Final Factor
Member 1	1.04		1.02	0.98	1.04
Member 2	0.96		1.04	1.03	1.03
Member 3	0.99		0.97	0.98	0.94
Member 4		1.02	1.02	1.03	1.07
Member 5		1.03	0.97	0.97	0.97

- MCO average risk score based on members enrolled during rate period

- MCO risk scores and cap payments updated throughout contract year (similar to current re-composite schedule)

- Anticipate rolling base period for risk score assignment (similar to Medicare)

- Age-Sex/Predictive Score normalized to CommCare population

- Geo/Benefit factors normalized to CommCare population

Rate Period - Actual Enrollment at MCO

Member 1	1.04
Member 2	1.03
Member 5	0.97
MCO Average	1.01

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Massachusetts' Commonwealth Health Insurance Connector Authority (CCA)

AUDIT AND REVIEW OF AUTHORITY RISK ADJUSTMENT AND PREVENTIVE INCENTIVE PROGRAM PROCESSES

August 17, 2009

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I. Executive Summary

Ingenix Consulting (IC) was retained by the Commonwealth Health Insurance Connector Authority (CCA) to review the risk adjustment and preventive utilization calculation programs established to implement certain aspects of the Fiscal Year 2010 Commonwealth Care contracts with participating MCOs. Several objectives were outlined at the start of the project, including:

1) Ensuring that processes accurately reflect contract language and verifying the integrity and accuracy of programs employed to perform calculations,

2) Recommending corrections or improvements where appropriate, and

3) Developing process control reports to be integrated into the existing processes. Following are the results of this review.

Ingenix Consulting verified that CCA's risk adjustment and preventive utilization processes are accurate and sound. This was accomplished through the execution of an on-site, line-by-line review of CCA's SAS programs, test runs of said programs, and the creation of process control reports to monitor the programs. Where CCA provided documentation, IC verified that the SAS programs are consistent with the processes as they are laid out in the FY10 Commonwealth Care contracts. Where appropriate, IC has recommended changes and improvements to the programs. Finally, IC created process control reports which CCA can use to monitor the risk adjustment and preventive utilization programs each quarter. The combination of summary and sample tables allows CCA to check the resulting SAS tables both in aggregate and in detail. This will enable CCA to identify any underlying data issues throughout the calculation processes. The end results of this project are two processes that have been verified as true to CCA's intent and that have control processes in place to verify their integrity on an ongoing basis.

II. Program Review

RISK ADJUSTMENT OVERVIEW

The FY 2010 Commonwealth Care contract between the Connector Authority and participating MCOs specifies a methodology that will be employed to adjust capitation payments based on a variety of factors developed by the Authority, as well as the application of DxCG, a proprietary software licensed by the Authority. This section of the contract is attached as Appendix A. The process developed by the Authority to implement this section of the contract includes three major components, each of which were reviewed in detail by IC:

1. DxCG Input File, which is draws information from claims and enrollment data held by the Authority to formats to run through the DxCG software product licensed by the Authority.

2. Risk Adjustment Output File, which captures output from DxCG and formats for performing final risk adjustment calculations

3. Risk Adjustment Calculation, which calculates MCO specific risk adjustment factors as stipulated in the contract (Appendix A).

RISK ADJUSTMENT DXCG INPUT FILE

The program Risk Adjustment DxCG Input File.sas summarizes claims and enrollment data in the format required by the DxCG model. The DxCG model uses the data to calculate a risk score for each member. IC reviewed these programs and interim data sets to ensure that information supplied to DxCG accurately reflects the underlying claims and enrollment experience of the specified time periods and populations. Upon review, the program appears to be accurate and sound. Members are correctly assigned to groupings such as Federal Poverty Level groups and regions. Claims and enrollment data are filtered correctly by the dates specified. All dates used to define the data period are specified as variables at the beginning of the program, which will help to eliminate errors that could occur when updating the code each quarter. Member months are calculated correctly and assigned accurately at the member level. Similarly, total claims costs are calculated correctly and assigned accurately at the member level. Claims are accurately grouped into the IP, OP, Facility, and Rx categories. In the section of code that defines lab and radiology claims, we recommend adding revenue codes 400-403 to the criteria. Details are specified below in the Program Modifications section of this report.

RISK ADJUSTMENT OUTPUT

The program Risk Adjustment Output.sas converts the text files created by the DxCG model into SAS datasets to be used in the risk adjustment calculation. Upon review the program appears to be clean and straightforward. The summary and sample process control reports that were developed as part of this project were used to verify that the text files were imported correctly and no records were dropped. IC verified that member months, member counts, and total dollars at the member level and summarized by MCO tie out to the inputs file. The process control reports are described in detail on page 4 of this report. Gender, predictive expenditure

Program Review (cont'd)

ranges, risk levels, and aggregated condition categories are appropriately assigned at the member level. No modifications to the program are recommended at this time.

RISK ADJUSTMENT CALCULATION

The program Risk Adjustment Calculation.sas uses enrollment data and the DxCG model output (converted to a SAS dataset by the Risk Adjustment Output program) to calculate normalized risk scores for each member and summarize the results by managed care organization and plan type. Upon review, the program appears to be clean and efficient. This calculation accurately reflects contract language in the attached appendices. Similar to the DxCG Input File program, all inputs that will need to be updated quarterly are defined as variables at the beginning of the program. Several of these variables are tables of externally-developed factors, such as age-sex and geographic factors. The current program includes a comment that dates should be included in the names of these files in the future. We strongly recommend doing so, especially if the factor tables will be updated periodically. This will clarify exactly which factors were used in a given run of the program. IC also determined that the program correctly assigns age-gender categories and corresponding age-sex scores, regions and corresponding geographic factors, benefit plan factors, and discount factors based on MCO and region to each member record.

CCA asked IC to do a careful review of the normalization calculation incorporated into this program. In particular, IC was tasked with ensuring that the SAS code is consistent with the spreadsheet calculation developed by Wakely Consulting Group. When CCA implemented the DxCG model, the developers recommended that the DxCG risk scores only be used for members with at least 7 months of data (the "Long" cohort), in order to avoid credibility issues. For members with 6 or fewer member months (the "Short" cohort), CCA uses an externally-developed age-sex factor instead of the risk score from DxCG. IC verified that the program accurately assigns members to the "Long" and "Short" cohorts and that the DxCG risk scores and age-sex scores are appropriately attributed to each member based on his or her cohort. Due to the differences in how the age-sex factors and the DxCG risk scores are developed, the factors need to be normalized to the same basis before members in the "Short" cohort can be compared to members in the "Long" cohort. This is accomplished by applying a normalization factor equal to the ratio of the weighted average risk score to the weighted average age-sex factor. The weighted averages are calculated using the benefit plan factors as weights. Upon review, the SAS code is consistent with the spreadsheet calculation developed by Wakely. We do, however, recommend removing the rounding that takes place in interim steps (such as the creation of the norm_calc table) because it will change the final outcome of the calculation. If rounding is aesthetically desirable for reviewing test tables, it should be done in separate steps that are not carried through to the end calculation. Details are specified below in the Program Modifications section of this report. Finally, IC confirmed that the program correctly calculates the average risk scores by MCO.

Program Review (cont'd)

PREVENTIVE VISIT OVERVIEW

The FY 2010 Commonwealth Care contract also includes a preventive visit incentive program, for which the Connector Authority compares an MCO's rate of preventive visits for certain populations to the population average, as well as to a base period rate. The methodology for calculating and applying these rates is attached as Appendix B. IC performed an in-depth review of both the methodology that the Authority employed to identify and group members, as well as the identification and classification of preventive visits.

PREVENTIVE UTILIZATION INCENTIVE PROGRAM 4.09

The program Preventive Utilization Incentive Program 4.09.sas summarizes preventive visit rates for auto-assigned and new/gap members for each managed care organization. These rates will be used in the administration of CCA's preventive utilization incentive program. Upon review, the program appears to be accurate and sound. IC verified that this program correctly identifies preventive claims. The list of CPT codes used to define preventive visits is in line with IC's standard definition. IC's standard definition includes codes 99383-99387 and 99393-99429 as preventive visits. Because CCA is only concerned with preventive utilization for adults, codes 99383-99384 and 99393-99394, which cover ages 1-4 years and 5-11 years, are excluded. Codes 99406-99409, which cover smoking cessation and alcohol and substance abuse screening, are also excluded from CCA's list. IC's standard definition of preventive visits also includes well baby visits, CPT codes 99381-99382, 99391-99392, and 99460-99464. Again, because CCA is concerned with preventive utilization for adults only, these codes are not included in CCA's preventive visit definition. The exception is code 99381, the initial preventive visit for an infant under 1 year of age, which CCA does include. This is reasonable because preventive visits for the mother may occasionally be assigned to this code. IC also verified that auto-assigned and new/gap members included in the preventive utilization calculations are correctly identified according to the methodology described in the contract language (Appendix B) and that they are assigned to the correct MCOs. The program accurately calculates member months in the base period and assigns them at a member level. Members included in the calculation are correctly limited to those with at least 6 months of enrollment in the base period. IC checked that preventive claims are correctly assigned to auto-assigned and new/gap members and that the preventive utilization rates for each MCO are calculated correctly. Unlike the risk adjustment programs, there are date boundaries entered throughout this program. We recommend creating variables to store these dates at the beginning of the program so that they only need to be updated in one place each quarter. We also recommend some changes to the duplicate testing sections of the program which will make it easier to identify duplicates. Finally, there was a reference to a table named merged_members_plans_1. This table does not exist elsewhere in the program. We assumed it should reference the table merged_members_plans_final instead, and updated the program accordingly. Details are specified below in the Program Modifications section of this report.

III. Process Control Reports

IC developed separate SAS programs to generate process control reports for each of the programs listed above. These programs are included in the set of deliverables. Following is a description of the process control reports.

SUMMARY TABLES

For each of the programs listed above, a series of summary tables were developed to track the data in each table of the program. The tables are generated in SAS using "proc tabulate" statements and are automatically exported into an Excel spreadsheet. Measurable items such as member months are summarized by standard fields (e.g., plan name) in each table. Reviewing each table in succession will allow CCA to check that 1) values are reasonable, and 2) the changes from one table to the next are as expected. Because extensive testing has already been incorporated into the Risk Adjustment Calculation program, no summary tables were developed for that program.

SAMPLE TABLES

For each of the programs listed above, a series of sample tables were developed to track a small set of individual members through the processes. Following creation, these tables are exported to Excel files. The Excel files include an extra tab that summarizes each sample table in a print-friendly format. CCA should update the list of sample cases each quarter, being careful to select a variety of members in order to test all parts of the program. For example, the sample for the risk adjustment programs should include at least one member from the "Short" cohort and at least one member from the "Long" cohort. It would also be beneficial to include members from a variety of benefit plans and geographic regions, and different age-sex groups. Similarly, the sample for the preventive utilization program should include at least one member from the auto-assigned additions and at least one member from the new/gap additions. Examples are shown in the tables below.

Sample Cases for Risk Adjustment

RHN	Age	Sex	Age-Sex Group	Total Member Months	Region	Plan Type	Plan Name	Elig Group
1111111	24	2	19_24 F	12	sou	I	BMC HealthNet	LONG
2222222	57	1	55_64 M	12	sou	II	Neighborhood	LONG
3333333	27	1	25_34 M	9	wes	III	Network Health	SHORT

Sample Cases for Preventive Utilization

RHN	Number of Claims	Auto Assign Flag	Type	Plan Name	Member Months	Usage Category
9999999	0	True	Auto-Add	Fallon	6	Non-Users
8888888	2	True	Auto-Add	BMC HealthNet	12	A Users
7777777	1	N/A	New/Gap	BMC HealthNet	12	A Users

IV. Program Modifications

All program changes are modification marked (e.g., Mod: 001) within the programs. The modifications are listed below.

1. *Program: Risk Adjustment DxCG Input File_v2*

   Mod 001: Include revenue codes 400-403 in lab/radiology definition.
   Only Change:

   ```
   /*Mod 001: Include revenue codes 400-403 in lab/radiology definition*/
   %let labrad =
     (rev_code in (335, 339, 409)
      or 300 le rev_code le 324
      or 329 le rev_code le 333
      or 340 le rev_code le 359
      or 400 le rev_code le 404
      or 610 le rev_code le 619 or
      (&hcpcs. and
       ("70000" le proc_cd le "89999"
       )
      )
      or prov_type in (84, 225)
      or prov_specialty in ("63","94","95")
      or pos = "C81"
      );
   ```

2. *Program: Risk Adjustment Output*

   No modifications recommended at this time.

3. *Risk Adjustment Calculation_v2*

   Mod 001: Remove rounding from interim steps in normalization calculation.
   Example:

   ```
   /*Mod 001: Remove rounding from interim norm calc steps*/
   /*plantype = round(benefit_score/count,.0001);
   agegender = round(age_plan/benefit_score,.0001);
   risk = round(risk_plan/benefit_score,.0001);
   region = round(risk_region/risk_plan,.0001);*/
   plantype = benefit_score/count;
   agegender = age_plan/benefit_score;
   risk = risk_plan/benefit_score;
   region = risk_region/risk_plan;
   ```

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Program Modifications (cont'd)

4. *Preventive Utilization Incentive Program_v2*

Mod 001: Change manual date entries to variables at beginning of program.
Example:

```
/*Mod 001: Set start and end dates as variables*/
%let enrol_yrmo_start = '200707';
%let enrol_yrmo_end = '200806';

/*Mod 001: Set start and end dates as variables*/
/*if add_yrmo < 200707 then auto_group = 'Previous Year   '; *update date when
reporting year changes;
if add_yrmo ge 200707 then auto_group = 'Current Year';*/
if add_yrmo < &enrol_yrmo_start. then auto_group = 'Previous Year   ';
if add_yrmo ge &enrol_yrmo_start. then auto_group = 'Current Year';
```

Mod 002: Revise duplicate testing code.
Example:

```
/*Mod 002: Update duplicate testing*/
/*proc summary data=merged_members_plans_final nway missing;
class rhn;
output out = dupe_rhns (drop = _type_ _freq_) ;
run;*/
proc summary data=merged_members_plans_final nway missing;
class rhn;
var count;
output out = dupe_rhns (drop = _type_ _freq_) sum=;
run;
proc sort data=dupe_rhns;
by descending count rhn;
run;
```

Mod 003: Correct table reference
Only Change:

```
/*Mod 003: Correct table reference*/
/*proc sort data=merged_members_plans_1;*/
proc sort data=merged_members_plans_final;
by rhn;
run;
```

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V. Appendices

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APPENDIX A

FINANCIALS

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EXHIBIT 1: CAPITATION RATE ADJUSTMENT METHODOLOGY

The Authority will determine a single composite rate on a prospective basis for each Health Plan based on the Health Plan's actual enrollment. This rate will be calculated by averaging the individual rating factors for all members enrolled in the Health Plan during the enrollment period used for composite calculation. These composite rates will be updated quarterly during the rate year. For the first quarter, each Health Plan will be paid initially based on a 1.0 average rating factor, with a subsequent reconciliation based on actual enrollment, rating factors and discounts. For the second, third and fourth quarters, each Health Plan will be paid at the average rating factor based on enrollment in the prior quarter.

The PMPM capitation rate to be paid to each Health Plan is equal to:

$$Target \times RF_{HP} + Admin$$

Where:
Target = Statewide Medical only Target for CommCare Program = \$369.00 PMPM
RF_{HP} = Average rating factor for the Health Plan =

$$\frac{\sum_{i=1}^{Total\ Members}(Geo_i \times Plan_i \times Disc_i \times Risk_i)}{Total\ Members}$$

Where:
Geo_i = Geographic factor for Member i at the Health Plan (see table below)
$Plan_i$ = Plan Type factor for Member i at the Health Plan (see table below)
$Disc_i$ = Discount factor for Member i at the Health Plan (Bid values by Region for each MCO)
$Risk_i$ = Risk factor for Member i at the Health Plan (see further discussion below)

Admin = Non-Medical expenses (administration, profit, contingency and risk):
\$32.00 PMPM (Incumbent Health Plans)
\$35.00 PMPM (Health Plans new to the CommCare program)

Example:

For example, assume a 'new' Health Plan had the following membership in the first quarter:

Member	Plan Type	Region	Age	Gender	Rating Factors				
					Plan Type	Geographic	Discount	Risk	Total
001	I	North	27	F	1.0619	0.9468	0.9800	0.8694	0.8566
002 *	I	North	22	F	1.0619	0.9468	0.9800	0.9970	0.9823
003	II	North	35	M	0.9461	0.9468	0.9800	0.9108	0.7996
004 *	II	Central	44	F	0.9461	1.1589	0.9650	1.0350	1.0950
005	III	Central	54	M	0.8909	1.1589	0.9650	1.2533	1.2488
								Avg	**0.9965**

* Members 002 and 004 had seven or more months of experience during the historic experience period. Therefore, they receive a DxCG risk factor rather than an age/gender risk factor.

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The payment to this Health Plan in the first quarter would initially be:

$369 x 1.0000 + $35 = $404.00

A subsequent adjustment would be made such that the actual payment would be:

$369 x 0.9965 + $35 = $402.69

This Health Plan would also be paid $402.69 PMPM in the second quarter. Third quarter payment would be based on the distribution of members in the second quarter, and fourth quarter payment would be based on the distribution of members in the third quarter.

Plan Type Factors:

Plan type factors were developed based on differences in benefits among the three plans. The following table shows the final plan type rating factors:

Plan Type	Rating Factor
I	1.0619
II	0.9461
III	0.8909

Region Factors:

Geographic factors were based on historic experience adjusted for differences in plan type, demographics, health status as measured by the DxCG risk adjustment tool and judgment. The following table shows the final geographic rating factors:

Geography	Rating Factor
Boston Area	1.0199
Central	1.1589
North	0.9468
South	0.9799
West	0.8838

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Risk Factors:

The risk factor will be demographic only (age and gender) for members with less than seven months of enrollment in the 12 month historic experience period. The following table shows the final demographic risk factors:

Demographic	Rating Factor
19-24 Male	0.4926
19-24 Female	0.6680
25-34 Male	0.7011
25-34 Female	0.8694
35-44 Male	0.9108
35-44 Female	1.0275
45-54 Male	1.2533
45-54 Female	1.2273
55-64 Male	1.4968
55-64 Female	1.3582
65+ Male	1.6103
65+ Female	1.5062

For members with seven or more months of enrollment in the experience period, risk adjustment will be based on claims and demographics using the DxCG model (DxCG RiskSmart Stand Alone Model 26 Commercial All-Encounter Med + Rx Year 2). Experience from all health plans during the experience period will be combined for purposes of determining whether or not each member has sufficient experience to be assigned a DxCG risk score and for calculating the risk score if they do. DxCG risk scores will be normalized to the Commonwealth Care population so they can be incorporated appropriately with age/gender demographic factors. The normalization factor for the hypothetical rating period, September through November 2008, is **1.3723**. This factor will be updated and published quarterly.

The following table shows the implementation schedule with respect to risk adjustment. The schedule for claims data may change according to the availability of data. The goal of the Authority is to use data that is as current as possible, with three months of paid claims run-out.

Month Rates are Calculated	Months Rates are Effective	Enrollment Period for Composite	Claims Data Used
September 2009	FY10 Q1 Reconciliation: July thru September 2009	July thru September 2009	May 2008 - April 2009 (Paid through July)
September 2009	October thru December 2009	July thru September 2009	May 2008 - April 2009 (Paid through July)
December 2009	January thru March 2010	October thru December 2009	Aug 2008 - Jul 2009 (Paid thru October)
March 2010	April thru June 2010	January thru March 2010	November 2009 - October 2010 (Paid thru January)

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EXHIBIT 5: CARE MANAGEMENT INCENTIVE PROGRAMS

The Authority will calculate the Performance Incentive Programs as follows:

Annual Physical Incentive Program:

1. *Measurement Period (SFY 2010)*

    a. Members enrolled July 1, 2009 – June 30, 2010

    b. Claims incurred July 1, 2009 – June 30, 2010 and paid through December 31, 2010.

2. *Base Period (SFY 2009)*

    a. Members enrolled July 1, 2008 – June 30, 2009

    b. Claims incurred July 1, 2008 – June 30, 2009 and paid through December 31, 2009.

3. *Measurement Period Populations*

    a. Members Auto Assigned to the Health Plan.
        i. Includes members newly enrolled in Commonwealth Care through auto-assignment during SFY10 as well as members auto-assigned prior to the beginning of SFY10 who are enrolled in the Health Plan as of June 1, 2009.
        ii. Auto Assigned means the member was initially auto-assigned in Commonwealth Care according to the Connector's low-bidder algorithm, and has either remained enrolled or been auto-re-enrolled to the same health plan.

    b. Non-Auto Assigned Members who newly enroll in the health plan during SFY10.
        i. Members who enroll July 1, 2009 or later, and who have either (a) no prior Commonwealth Care experience or (b) a gap in Commonwealth Care enrollment of six months or greater.

    c. For both (a) and (b), members who are enrolled in Health Plan for six months or more during FY10.

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4. *Base Period Populations*

    a. Members Auto Assigned to the Health Plan.
        i. Includes members newly enrolled in Commonwealth Care through auto-assignment during SFY09 as well as members auto-assigned prior to the beginning of SFY09 who are enrolled in the Health Plan as of June 1, 2008.
        ii. Auto Assigned means the member was initially auto-assigned in Commonwealth Care according to the Connector's low-bidder algorithm, and has either remained enrolled or been auto-re-enrolled to the same health plan.

    b. Non-Auto Assigned Members who newly enroll in the health plan during SFY09.
        i. Members who enroll July 1, 2008 or later, and who have either (a) no prior Commonwealth Care experience or (b) a gap in Commonwealth Care enrollment of six months or greater.

    c. For both (a) and (b), members who are enrolled in Health Plan for six months or more during FY09.

5. *Preventive Visit Rate*

    a. Preventive Visit Rate = Total Members in Measurement Population Who Receive a Preventive Visit (as defined below)/ Total Members in Measurement Population

    b. Preventive visit is defined as CPT Codes 99385-99387, 99395-99397, 99401-99404, 99411, 99412, 99420 and 99429

6. *Incentive Payment Criteria*

    a. Health Plans achieving one of the following six goals will receive $1 dollar PMPM of the incentive payment.

    b. Health Plans achieving two of the following six goals will receive $2 dollars PMPM of the incentive payment (there will be a total maximum payout of $2.00 PMPM, even if more than two of the goals are achieved by the health plan.)

        1. Increase Auto Assign Visit Rate from the base period to the measurement period by five percentage points

        2. Increase Non-Auto Assigned Visit Rate from the base period to the measurement period by five percentage points

        3. Increase Combined Visit Rate from the base period to the measurement period by five percentage points

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4. Achieve Auto Assign Visit rate equal to or greater than 5 percentage points above Commonwealth Care average during the measurement period, with no decline from base period

5. Achieve Non Auto Assign Visit rate equal to or greater than 5 percentage points above Commonwealth Care average during the measurement period, with no decline from base period

6. Achieve Combined Visit rate equal to or greater than 5 percentage points above Commonwealth Care average during the measurement period, with no decline from base period

7. Reporting

c. Authority will provide Contractor with a base period preventive visit rate estimate by July 31, 2009. This estimate will be based on the most recently available paid claims extract for Fiscal Year 2009 with three months of claims run-out and corresponding enrollment information. Thereafter, the authority will provide Contractor with interim preventive visit rate updates on a quarterly basis.

All incentive payments will be calculated and paid out with final settlement as described in Section 4.6 of this Contract.

In order to be eligible for such incentive program, Contractor must have participated in Commonwealth Care prior to the start of Contract Year 2010.

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