



Computer Actuarial Assessment Model: An Executive Overview

Why we need it. What it does. How it works.

CA2M: Why we need it now

When it comes to health care, it is clear that the American people do not believe their elected officials, insurance companies and medical providers have figured out how to deliver the affordable, accessible, quality care they want and/or need. Their dissatisfaction has made health care a major, if not the major issue, in national and local elections for more than a decade and it is now clear it will play a major role in the upcoming 2020 campaigns as well. The public frustration and irritation are, unfortunately, justified. American health care is for large segments of the population either not affordable, not accessible, not good enough or some combination of all three, and the question that baffles most of us is why we can't seem to get it right. The Concerned Actuaries of the U.S. believes that the answer to that question is two-fold. First and foremost, we don't get it right because while our goals are laudatory, we do not engage the complexity and interactive phenomena of the health care system with the understanding and rigor required to actually achieve those goals. Imagine, for example, the complexity of determining the number, location, and cost of the additional doctors, nurses, and allied health care professionals needed simply to maintain the 2008 health care status quo as forty million people were added to the Medicare and Medicaid roles between then and 2017. Our failure to adequately address that challenge meant for a variety of populations access got worse. Second, we don't get it right because we don't have access to the broader matrix analytics we need to make informed decisions and without that data the general public cannot effectively consider the merits of the changes being proposed.



CA2M - What it is being designed to do.

The Computer Actuarial Assessment Model (CA2M) has been developed to address both of these challenges. CA2M, for example, is a matrix-based model that can provide timely, relevant, and powerful analytical ability to determine whether proposed changes will improve or harm America's health care system. As such it can more fully inform both policymakers and their constituencies.

It is important to note that the Concerned Actuaries of the U.S. is dedicated to enhancing public and policymaker ability to understand, evaluate and interact more effectively with decisions affecting the American healthcare system. The CA2M is a developmental tool intended to help policymakers and their constituents determine whether or not the changes being proposed might actually achieve their stated objectives and whether or not there might be unintended consequences attached to such changes. To that end, the model output highlights both the magnitude and duration of positive and negative consequences and challenges advocates to address questions that experience tells us need to be asked. For example, had the CA2M been available in 2008 to provide such information, the following questions could have been raised (and possibly addressed) at that time, including:

- Won't rising costs force the government to further discount payments?
- Won't deeper discounts lead to cost-shifting to the private sector? And, won't that in turn eventually lead to rising out-of-pocket expenses for consumers?
- Won't increased urban demand for care result in shortages in rural areas?
- What happens in terms of costs and sustainability if population health status deteriorates at a faster rate?

While a work-in-progress, CA2M provides a strong framework to facilitate much more responsible consideration of health policy. Using this model to illustrate the broader



impact of a given policy proposal should lead directly to an expectation that the public dialog expand beyond talking points.

CA2M - How it works.

The CA2M's key features include:

A. An analytical matrix designed to provide the most holistic assessment currently available of how proposed changes to the American healthcare system might affect the system and the people who depend upon it. The matrix includes:

1. An "X" axis that recognizes key market signals we believe reflect the areas of major activities and outcomes currently operating in the American healthcare system, including cost, coverage, access, health status, the economy, and sustainability;
2. A "Y" axis that we believe recognizes all current service access platforms in the American healthcare system, including large group, small group, individual, Medicaid acute, Medicaid disabled, uninsured, Medicare, and an "other" category;
3. A database that contains detailed, reliable, accessible information and expert opinion on eleven critical variables that inform the assessment of interactive impact in each of the 48 intersections identified in the matrix, including population factors, cost estimates, risk market factors, demographics, and utilization, health status, market costs, benefits, availability of providers, revenues and expenditures, and GDP.

B. An output capacity designed to identify for policymakers, opinion leaders, the news media, and the general public the ripple effect of proposed actions and provide these same audiences with a mechanism that helps them understand in which areas the proposed changes need more work. The CA2M can, for example, highlight interactive challenges and opportunities of a proposed change related to provider infrastructure; financial sustainability; patient accessibility; household affordability; general economic impact, and others.



C. An experiential growth capacity that allows the model to adjust and accommodate to reflect additional and/or new information as it becomes available. For example, the model includes a variety of behavioral algorithms that will evolve as new and/or additional data about specific behaviors becomes available.

CA2M - Current Status

The CA2M is progressing through a series of five, carefully considered and sequenced development phases that began in late 2017. Pending the acquisition of adequate funding and recruitment of additional expert resources, model development is poised to enter into Phase III. (see below).

I. Design and development of the “X” and “Y” axes of the comparative matrix.

OBJECTIVES	PROCESS						OUTCOMES
	3RD QUARTER 2017	4TH QUARTER 2017	1ST QUARTER 2018	2ND QUARTER 2018	3RD QUARTER 2018	4TH QUARTER 2018	
<ol style="list-style-type: none"> 1. Design and construct a prototype of the desired model. 2. Survey the existing, publicly available, relevant data bases. 3. Develop the model to the point that it is possible to undertake a rudimentary test of the model. 							<ol style="list-style-type: none"> 1. A prototype of the desired model: <ol style="list-style-type: none"> a. capable of facilitating CAG’s ability to help the public understand the complex and interactive nature of the American healthcare system; and, b. informed with existing, publicly available, relevant data bases; actuarial economic principles and assumptions based on actuarial science and experience; c. able to conduct a rudimentary test that could be used to engage and gain feedback from a sample group of opinion leaders and experts. d. Several rudimentary test runs of the model. 2. The convening of a Roundtable discussion with national opinion leaders and experts about the need for a broader conversation and better analytics and the feedback that discussion generated.
<p>In order to undertake enhanced comparative analysis of proposed changes to the American healthcare system, CAG must identify, define and delineate the critical intersections at which meaningful interaction may affect the health care system.</p> <p>A lead model development team, headed by Mark Litow, was established. CAG members spent months identifying and defining the two main axes of the model. These include an “X” axis that includes the six “Market Signals” and the “Y” axis that includes the seven “Service Access Platforms” reference above and a Compound Impact intersection for each Market Signal. The development team then spent more months defining the forty-eight intersections in the grid in terms of the nature of the interaction within that location, the possible ripple effects, existing data bases, and relevant actuarial principles and experiential record.</p> <p>The team then spent more months loading data and building preliminary assumptions and algorithms into the model.</p>							



II. Advanced documentation and enhanced capability of the prototype model

OBJECTIVES	PROCESS					OUTCOMES
	4th QUARTER 2018	1ST QUARTER 2019	2ND QUARTER 2019	3RD QUARTER 2019	4TH QUARTER 2019	
<ol style="list-style-type: none"> Advance the development of the model from prototype to pre-operational status in terms of improved specificity regarding Market Signals and Service Access Platforms; expanded and enhanced data sets; refinement of experiential and actuarial economic assumptions; identification of comparative points of analysis and development of operational algorithms. Develop the model to the point that it is possible to demonstrate to potential funders and other interested parties that when fully operational, the CA2M will offer a level of analytic capability that is not currently available, but is absolutely essential to improve the healthcare system policy making process. 	<p>In order to advance the comparative analysis of proposed changes to the American healthcare system, CAG address a variety of questions about the model related to accuracy, sufficiency, relevancy, and operational nimbleness and capacity.</p> <p>The model development team, still headed by Mark Litow, was expanded to include new volunteer experts and spent all of 2019 months understanding, enhancing, expanding and refining the main matrix categories; data bases; experiential interpretations and assumptions; and strengthening the algorithms.</p>					<ol style="list-style-type: none"> A pre-operational version of the CA2M. A pre-operational model test run of the model to share with funders and other interested parties. A deeper understanding of the work required to move the CA2M to beta-testing status.

III. Advanced documentation and enhanced capability of the pre-operational model.

OBJECTIVES	PROCESS			OUTCOMES
	4th QUARTER 2019	1ST QUARTER 2020	2ND QUARTER 2020	
<ol style="list-style-type: none"> Advance the development of the model from prototype to pre-operational status in terms of improved specificity regarding Market Signals and Service Access Platforms; expanded and enhanced data sets; refinement of experiential and actuarial economic assumptions; identification of comparative points of analysis and development of operational algorithms. Develop the model to the point that it is possible to demonstrate to potential funders and other interested parties that when fully operational, the CA2M will offer a level of analytic capability that is not currently available, but is absolutely essential to improve the healthcare system policy making process. 	<p>In order to advance the comparative analysis of proposed changes to the American healthcare system, CAG must obtain funding to address research needs; the model's computer programming needs; algorithm refinements; recruitment of additional functional experts to participate in the development; and communications needs related to formatting and transparency.</p> <p>The model development team has identified the work required to accomplish Objectives 1 and 2 and is now engaged with raising the required funding.</p>			<ol style="list-style-type: none"> The required funding. A beta-test model test run of the model to be shared with policy makers, interested and affected parties and the general public. Recommendations for Phase IV.



IV. Beta-Testing of the CA2M.

OBJECTIVES	PROCESS			OUTCOMES
	3RD QUARTER 2020	4TH QUARTER 2020	1ST QUARTER 2021	
1. Demonstrate the ability of the CA2M to provide timely, useful and relevant comparative analysis of proposed changes to the American Healthcare system. 2. Leverage the relevance and usefulness of the beta-tests undertaken to engage policy makers; interested and affected parties and the general public in more meaningful and infinitely better informed discussions about American health care. 3. Raise the funding required to accomplish the above.				1. The required funding. 2. A series of at least three beta-test model test runs that can be shared with policy makers, interested and affected parties and the general public. 3. Recommendations for Phase V.
	In order to build credibility for the CA2M CAG must demonstrate its capabilities. To that end, the model development team will identify a series of possible test runs and undertake those runs.			

V. Establishment of a continual improvement and maintenance program for the CA2M.

Developmental Stages - Overview

Developmental Phase	1ST QUARTER 2018	2ND QUARTER 2018	3RD QUARTER 2018	4TH QUARTER 2018	1ST QUARTER 2019	2ND QUARTER 2019	3RD QUARTER 2019	4TH QUARTER 2019	1ST QUARTER 2020	2ND QUARTER 2020	3RD QUARTER 2020	4TH QUARTER 2020
PHASE I. Design and development of the "X" and "Y" axes of the comparative matrix.												
PHASE II. Advanced documentation and enhanced capability of the prototype model.												
PHASE III. Advanced documentation and enhanced capability of the pre-operational model.												
PHASE IV. Beta-Testing of the CA2M.												
RELATED ACTIVITIES - PAST, PRESENT AND FUTURE	Development of CRFB Collaboration Development of Primer Materials Washington, D.C. Roundtable Discussion Fix the Debt Webcast				Development of CA2M Outreach Materials Design of Regional Outreach Efforts with CRFB Meetings with Potential Funders				Regional Outreach Efforts with CRFB Policy Maker Outreach Efforts with CRFB			



CA2M - Frequently Asked Questions

Is the Concerned Actuaries of the U.S. (CAUS) advocating for a particular recommendation or set of recommendations on how to “fix” the American Health Care system?

NO.

The CA2M is dedicated to evaluating proposed changes offered by others. CAUS does advocate for actuarial and economic principles related to the fiscal, and management factors both training and experience tell us affect the quality, sustainability, and efficiency of the system.

Is CAUS willing to share the information and assumptions that serve as the basis of the CA2M assessments?

YES.

Comprehensive documentation of the CA2M's assumptions, calculations and base line data is available and will be made accessible for public review.

Has the CAUS tested the CA2M on a proposed change to the American Health Care system?

YES.

The Concerned Actuaries of the U.S. beta-tested CA2M's capability by using only information available in 2008 to evaluate the Affordable Care Act (as enacted) as a



proposed reform against the data and assumptions existent at that point in time. The test was successful both in projecting a significant number of positive and negative outcomes that eventually occurred and in identifying areas in which more data was needed and where algorithms needed adjustment.

Has the CAUS tested the CA2M the “Medicare for All” proposals?

NO.

There are a variety of “Medicare for All” ideas, none of which currently have enough detail to qualify as proposals and cannot, therefore, be assessed accurately. For example, It is impossible to evaluate the positive and negative impacts of such changes without considerably more data than appears to be available about what exactly would be involved in making these transitions.

The CAUS has raised concerns about the sustainability of the current American healthcare system. Does the CA2M measure the sustainability of proposed changes?

YES

In the context of the CA2M Model, “Sustainability” relates to the likelihood of a reform contributing to the ability to maintain the health system without interruption or weakening over the long-term (years or even a decade or more).

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