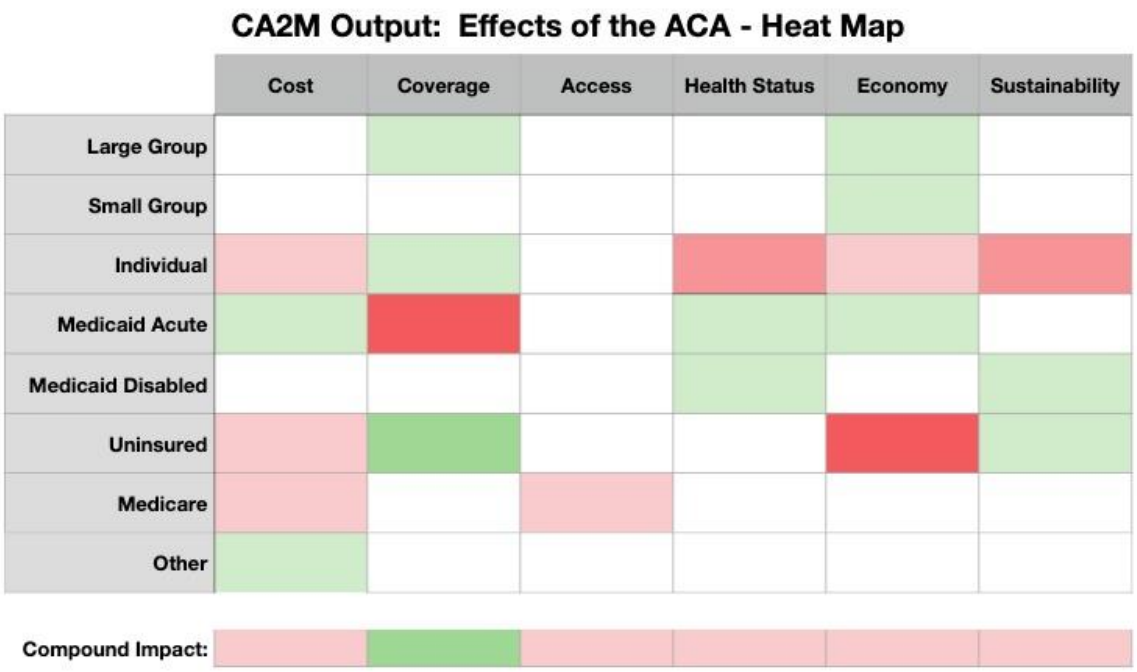
CA2M
Concerned Actuaries of the U.S.

Understanding Value

The Concerned Actuaries Group has developed the CA2M model to facilitate improved health care policy decision-making. The model analyzes how a given policy affects six market signals across eight coverage delivery mechanisms. This paper discusses the concept of "value" within this framework.

Introduction

Depicted below is the output of the CA2M demonstration of the effects of the Affordable Care Act (ACA), in the form of a "heat map". The various impacts of this reform are represented directionally (positive impact is green, negative impact is red) and by order of magnitude (light shading is modest impact, medium shading is moderate impact, dark shading is significant impact).



The power of the CA2M framework is that it facilitates the discipline of considering the effects a policy will have on every one of these interdependent variables. Better decision-making will result from such multi-dimensional analysis.

The Need to Know: Can this holistic analysis be advanced to the point of calculating the full net "value" of a policy, combining these component indicators to determine if a policy is producing an overall net positive or negative result for society?

In theory, perhaps so. But as a practical matter, there are a great many significant challenges inherent in such an endeavor. The remainder of the paper delves further into the topic of "value" in the context of policy decisions and the CA2M model.

I. A Definition of Value

Value is defined per the Webster Dictionary as:

- The monetary worth of something
- A fair return or equivalent in goods, services, or money for something exchanged
- Relative worth or importance of

II. The Creation, Enhancement, Use, and Destruction of Value

In the CA2M model, we attempt to depict changes in value brought about by a given policy. These may be increases or decreases in dollar-denominated economic value or in certain other non-economic measures of social well-being. We do so to facilitate comparisons of different scenarios.

Economic value can be represented by a formula. Economic value is equal to the net worth of an asset, product, service or other identifiable item/factor. It should reflect all compensation and rewards and all debts and liabilities. Value changes over time. It is createable, enhanceable, usable, and destroyable.

- Value Creation and enhancement: Any act or process that increases value. This can be labor, invention, risk transfers/subsidies (through elimination/mitigation of a risk), cash infusions, or other investments.
- Value Use, Destruction or Reduction: Any act or occurrence that consumes a product or reduces value, or destroys or eliminates a product, labor, service, or investment.

Not all measurement of social well-being is translated to dollar-denominated economic value in our analysis. However, the concepts of value creation, enhancement, use, and destruction can still be applied. In a non-dollar-denominated measure, value creation or enhancement (a positive outcome) occurs if social well-being, as represented by that measure, is increased. Conversely, value use or destruction occurs if social well-being is decreased.

III. Definition of Risk

Risk is defined per the Webster Dictionary as:

- Possible loss or injury
- Something that creates or suggests a hazard
- Peril related to a certain subject matter

In our analyses, risk reflects any factor that can potentially reduce value. In some instances, the risk associated with a possible occurrence or event can be a substantial reduction in value such that a transfer of that risk to some person or entity is essential.

IV. Definition of Risk Transfer

Transfer is defined per the Webster dictionary as:

- The removal or conveyance of a thing from one place or to another person
- The passing of control from one party to another

Webster does not define risk transfer, but combining the two definitions above produces the following:

- Removal or conveyance of the possible loss or injury from one party to another
- The passing of control of a hazard or peril from one party to another

In our analyses, a risk transfer represents any transfer of a health care system risk from one party to another, whether that transfer is from an individual to a private company or to government, or from a company or another entity to the government or vice versa.

V. Definition of Subsidy

Subsidy is defined per the Webster dictionary as:

- A sum of money granted by the government or a public body to assist an industry or business so that the price of a commodity or service may remain low or competitive.
- A grant or contribution of money to meet specific needs.

A subsidy is in essence a form of risk transfer where the risk is transferred from an entity (industry, business, or person) to the government. The rationale for this policy is generally that it is in the public interest. Regardless of whether a risk transfer includes a subsidy to some degree or not, the ultimate question to address should be what happens to the value of all the signals with the risk transfer/subsidy mechanism versus without it.

VI. Measuring Changes is Value change arising from a Risk Transfer or Subsidy (Holistic Requirement)

Risk transfers and subsidies often generate a significant number of changes across the landscape of people and entities directly and indirectly tied to them. In health care, changes focused on one specific area such as coverage often affect numerous other concerns, including the economy. Often the indirect effects can be as significant if not more so than the issue being addressed.

This interconnectedness of the health care system and its relation to the economy requires an assessment of material issues at the same time to assess the change in value. This means assessing the effect on cost, coverage, access, health status, economic implications, and system sustainability over time due to the risk transfer or subsidy proposed.

VII. CA2M Calculation and Depiction of Value Increase or Decrease

The CA2M model calculates the impact a given policy will have on six market signals as they play out across eight population segments. Each population segment corresponds to one of the major coverage delivery mechanisms: large- and small-group benefits, individual insurance acute- and disabled-Medicaid, the uninsured, Medicare, and certain “other” delivery mechanisms. CA2M calculates the positive (gain of value) or negative (loss of value) effect arising from the policy under review for each of these intersections. Internal to the model, certain of these market signals are dollar-delineated, while others are not. In either case, the principles outlined in the prior section are applied to ascertain whether value is gained, lost, or remains relatively unchanged. A brief review of the six market signals that are considered in the model follows:

- ***Cost***: What is the effect of the policy on the affordability of health care to various segments and in total? This signal is dollar-denominated.
- ***Coverage***: What is the effect of the policy on the proportion of individuals and families receiving coverage that is inadequate (too much exposure to risk given economic means), adequate (risk proportionate to economic means) or disproportionate (to little participation in risk given economic means, possibly leading to overconsumption)? Coverage may be private insurance or a government program. This signal is not dollar-denominated.
- ***Access:*** What is the effect of the policy on the timely availability of appropriate health care facilities, services, and supplies under a given policy to the individuals and families that need them? Quality of the services provided is included in this item. This signal is not dollar-denominated.
- ***Health Status:*** What is the effect of the policy on the overall health of each population segment and in total? The model assigns an expected morbidity cost (non-standard morbidity costs being reflective of non-standard health status) to each individual in a calendar year based on modeling of estimated debits per person. As such, this signal is currently measured in dollars; however, health status could also be measured in non-dollar terms, and likely will be as the model is enhanced over time.
- ***The Economy:*** What are the economic implications of the policy? Health and health care have many interactive effects on the economy, including jobs, wages, productivity, disposable income, debt, deficits, taxes, and investment. This signal is measured in dollars through changes in economic activity, but as there is a two-way relationship between health and income, non-dollar measures could also be used.
- ***Sustainability:*** Is the policy sustainable in the longer term, considering its effects on deficits, unfunded liabilities, economic participation, infrastructure needs, and capital needs? This signal has multiple elements, some of which are examined in dollars and others of which are not. This signal takes into account the relative

change in the component calculations under a given policy and is not, in the end, dollar-denominated.

The output of the model is most often depicted in matrix form, as a “heat map” indicating for each intersection of market signal and population segment the directional change in value and the magnitude of that change arising from the policy. A relative magnitude scale, e.g., one to ten, is sometimes superimposed. The exact mathematical calculations produced by the model are not reported, since they are not comparable across signals, owing to the different units of measurement delineating the market signals.

VIII. Illustrations of Value Determination

The purpose of the CA2M model is to better inform health policy decision-making by illustrating the inter-connected impacts arising from any policy. The format of the output clearly illustrates the presence and magnitude of multiple impacts. But could the model be made to calculate a single, combined net positive or negative “value” for the policy under consideration? In total, do the identified benefits of the policy outweigh the costs?

All six market signals could, in theory, be translated to a common unit of measurement, such as dollars. For example, a formula could compute the dollar-equivalent value of an improvement in access to health care for a segment of the population by taking into account resultant reductions in medical costs, gains in productivity, and added “quality-life-years” (with yet another formula applied to calculate the dollar value of a quality-life-year).

But, even if all such calculations were done, significant challenges would remain in order to determine a singular total net value. For example, the benefits and costs of that policy, accruing among different population segments, would all have to be given a

relative weight. An easy answer might be to weight them equally. But society may consider a particular benefit, say the comfort and dignity of frail elders, more important than the formulaic calculation of reduced costs and gained productivity reveals. While we believe all of the signals deserve material consideration, the precise weighting of costs and benefits among the signals and population segments is a matter for legitimate policy debate.

To delve deeper into the determination of value within the model, the following examples are provided. These are taken directly from the results of the CA2M demonstration of the effects of the ACA as summarized previously in Table 1.

Example 1: As is seen in Table 1, CA2M reports that the ACA has a favorable impact on the "Coverage" market signal for persons who were uninsured. The ACA led to a reduction in the number of such uninsured persons. A significant number of these people enrolled in Medicaid (a government-subsidized program), made possible by the ACA's expansion of Medicaid eligibility criteria. An additional number enrolled in private individual insurance, made feasible by federal subsidies provided to relatively low-income persons who buy individual insurance through one of the designated exchanges. This reduction in the number of uninsured is not a surprising result, and in fact, was one of the primary objectives of the ACA. Within CA2M, the decrease in the number of persons who are uninsured is reported as a favorable result (green in the heat map). Further relating this to the discussion of value earlier in this paper:

- Value can be deemed to have increased for persons gaining coverage because of the ACA.
- This particular increase in value was created largely by the mechanism of subsidy, i.e., the transferring of the risk of medical expense from these individuals to the government.

- CA2M does not calculate a dollar equivalence for this particular increase in value; it reports the direction and magnitude of change based on the number of persons experiencing a change in coverage and what type of change occurred.

Example 2: Also from Table 1, CA2M reports that the ACA has a negative impact on the "Cost" market signal for persons with individual coverage. For persons not covered by employer-sponsored plans and who are not eligible for federal subsidies, individual insurance policies have become much more expensive due to disruptions of the individual insurance market caused by the ACA. Within CA2M, the rapid increase in the annual dollar cost of medical insurance for the subset of people within the individual insurance market who do not receive subsidies leads to an unfavorable result - reported as red in the heat map. Because this is a subset, the overall result reported for the segment in its entirety is light red, indicating a modest aggregate result.

- Value can be deemed to have decreased for these persons because of the ACA.
- CA2M reports the direction and magnitude of change based on the aggregate annual dollar cost of medical insurance for this group of people.

Example 3: As is seen in Table 1, CA2M reports that the ACA has a negative impact on the "Sustainability" market signal for the individual insurance market. CA2M takes a number of factors into account in order to assess sustainability, including the relationship of health care cost trends to overall economic growth, the rate and direction of change in provider availability, the rate and direction of change in coverage, the relationship of trends in the cost of medical insurance to wage growth and the rate of change in government deficit spending brought about by a given reform. In the case of the ACA, the formulaic combination of these various factors leads to an unfavorable result being reported for the individual insurance market, owing largely to the accelerating cost-related factors and the increase in deficit spending brought about by the ACA's various subsidies.

- Value can be deemed to have decreased owing to the reduced sustainability of the individual insurance market.
- CA2M does not calculate a dollar equivalence for this particular decrease in value; it reports the direction and magnitude of change based on a formulaic combination of several factors, most expressed as rates of change.

Just from the three listed examples, we can readily see the complexity that would be involved in attempting to aggregate various positive and negative factors. How, precisely, does one compare the value gained by reducing the number of uninsured persons with the lost affordability of individual insurance for those who rely on it and with the reduced sustainability of the individual insurance marketplace itself? And these are just three of the 48 entries in the complete matrix. The ultimate calculation of a single net positive or negative societal value produced by a given policy would require additional judgments and relative weights that are appropriate for legitimate policy debate.

Summary and Conclusions

Trade-offs must be considered in the societal process of policymaking. Such policy decisions will be better informed and will lead to better results when all costs and benefits are explicitly considered, such as by using the CA2M model. CA2M output clearly delineates the specific gains and losses in value produced by a given policy across market signals and population segments but stops short of calculating a singular total net value for the reasons noted in this paper. The seeming additional precision of so doing would likely come at the cost of reduced acceptance and credibility, as some of the necessary calculations and weighting factors would have to be based on judgments not universally agreed upon. We believe the model output as currently designed can clearly contribute to better-informed health policy decision-making.

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