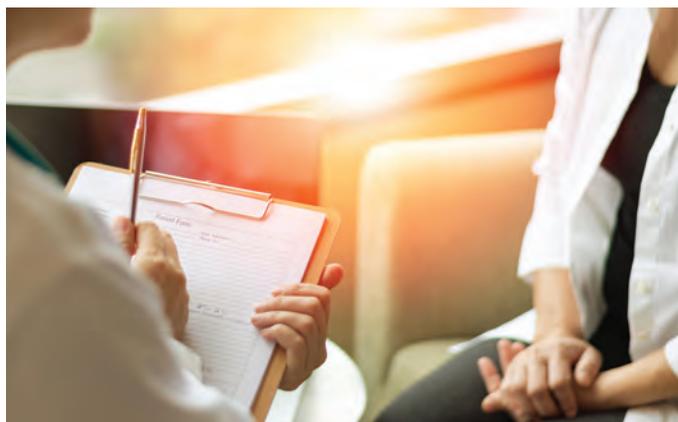




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An Actuarial Model to Improve Health and Reduce Costs

By Ken Beckman



Chronic disease accounts for 86 percent of U.S. health care costs and an ever-increasing share of individual, corporate and government budgets.¹ While everyone is searching for a solution to reduce chronic disease and lower costs, under the current health care framework there are no financial rewards (in some cases there are penalties) for health care providers to do just that. The result is the present unsustainable system that can be characterized as having uncontrolled risk, causing financial and possibly even physical harm to millions of individuals.

Actuaries have consistently developed long-term, stable financial security systems based on objective data that continue to be successful because risk is controlled and reduced. So consider if actuaries could implement a solution that provides lucrative financial incentives for health care providers to help reduce the prevalence of chronic disease. An example of this solution is illustrated in Figure 1. A diabetic patient incurs \$15,000 in total annual health care spending, of which the primary care physician (PCP) receives \$1,500. If the patient's diabetic condition can be reversed, the annual expected spending drops to \$7,500 with the PCP's share at \$750. The physician has done a great service in helping the patient improve their health and lower overall costs, but in the current system he or she is essentially penalized with a cut in pay since the patient has less need for

future medical services. However, under this Actuarial Patient Value model, the PCP receives an incentive payment of \$2,000, bringing the total compensation to \$2,750. The model takes a long-term view recognizing that eliminating a chronic condition will likely result in significant savings for the remaining lifetime of the patient. As a result, the \$2,000 payment continues for many years, assuming the patient's good health persists.

Simply stated, the Actuarial Patient Value model pays direct cash rewards to health care providers for improving and then maintaining patient health. While there are other systems that offer incentives such as the Medicare Advantage (MA) risk-adjustment mechanism and the Medicare Shared Savings Program, these tend to be of a short-term nature. For example, since MA plans are paid based on the patient risk score from the prior year, the plan actually receives less revenue in future years for a member whose health improved.² Similarly, with the Shared Savings Program, an ACO can receive payments based on a reduction in claims, but the benchmark against which these savings are determined is reset after three years.³ By setting aside the short-term rating focus that has traditionally been used in health insurance, actuaries have an exciting new opportunity that can significantly improve public health and reduce costs.

Figure 1

Actuarial Patient Value Model

	Year 1	Year 2	Year 3	Year 4	Year 5+
Diabetic Patient with HbA1c of:	9.0	6.5	6.5	6.5	6.5
Expected Total Health Spending	\$15,000	\$7,500	\$7,500	\$7,500	\$7,500
PCP Share of Health Spending	\$1,500	\$750	\$750	\$750	\$750
Incentive Payment to PCP		\$2,000	\$2,000	\$2,000	\$2,000
Net Savings Relative to Year 1		\$5,500	\$5,500	\$5,500	\$5,500

Values are for illustrative purposes only. Specific health spending amounts for diabetes can be found in American Diabetes Association, Economic Costs of Diabetes in the U.S. in 2012, <http://care.diabetesjournals.org/content/early/2013/03/05/dc12-2625.full-text.pdf> (accessed June 30, 2017).

CURRENT VALUE-BASED MEASURES

While actuaries are already involved with the increasing number of value-based reimbursement systems that are working to encourage better and lower cost care, the measures of value currently being used do very little to actually achieve these goals. As Harvard economist Michael Porter suggests, “Value should always be defined around the customer, and in a well-functioning health care system, the creation of value for patients should determine the reward for all other actors in the system.”⁴ If no measurement is being done of whether patient health outcomes are improving, it is difficult to determine if a health care system is providing any value. The Healthcare Effectiveness Data and Information Set (HEDIS) consists of about 80 different measures that are “used by more than 90 percent of America’s health plans to measure performance on important dimensions of care and service.”⁵ Similarly, CMS and other payers, providers and consumer groups developed “quality measures that payers have committed to using” so that by “focusing quality improvement on key areas across payers, quality of care can be improved for patients more effectively and efficiently” and “aid in value-based payment.”⁶ CMS is using these measures as part of its Quality Payment Program whose goal is helping providers “focus on care quality and the one thing that matters most—making patients healthier.”⁷ Porter observed, “In practice, quality usually

“[I]n a well-functioning health care system, the creation of value for patients should determine the reward for all other actors in the system.”

means adherence to evidence based guidelines, and quality measurement focuses overwhelmingly on care processes.” He characterized HEDIS primarily as “process measures, and none are true outcomes” and commented that “process measurement, though a useful internal strategy for health care institutions, is not a substitute for measuring outcomes.”⁸

To clarify the distinction between care processes and health outcomes, it is helpful to review three of these existing quality measures.⁹ The first involves hypertension, which is the number one reason patients visit their primary care physician.¹⁰ The measure “Controlling High Blood Pressure” captures the percentage of patients with a diagnosis of hypertension whose blood pressure was less than 140/90. While it is clearly not harmful to control a potentially life-threatening condition such as high blood pressure, simply having a reading under 140/90

does not promote optimal health since anything above 120/80 is considered abnormal.¹¹ The second involves diabetes, which has seen an increase in prevalence of more than 600 percent since 1960.¹² The measure “Comprehensive Diabetes Care: HbA1c Poor Control” determines the percentage of diabetic patients who have A1c readings of greater than 9 percent or failed to have their A1c recorded during the year. Given that accepted diabetic control is an A1c of 7 percent, it is unclear how a goal of 9 percent promotes health.¹³ The third involves body mass index (BMI), which is significant since 38 percent of adults are obese and 70 percent are overweight.¹⁴ The measure “BMI Screening and Follow-Up” is the percentage of patients who had their BMI recorded and for those outside the optimal range who had a documented improvement plan. While it is a positive step that patients understand their BMI and are alerted if they are overweight, since the measure does not record if the plan is being effectively implemented by reducing BMI over time, it does little to indicate improved health.

As a result of these and the other currently used measures of quality and value, providers are incentivized to design their practice to make sure patients take their medications, information is recorded in the medical records and preventive screenings are performed. Educating patients about how to prevent and reverse chronic disease is not a primary focus.

VALUE-BASED MEASURES IN THE ACTUARIAL PATIENT VALUE MODEL

So how can actuaries develop target measures that will lead to both improved patient health outcomes and lower costs? The first step is to determine metrics that provide clear and objective indication of patient health over time. These underlying metrics must correlate directly with health and not simply record whether a test was done or a condition monitored. While much of the potential data to be analyzed is already being captured in medical records, only by measuring the change in these values over time indicates whether health is improving. Some possible metrics to consider include, but are not limited to, BMI, blood pressure, A1c, cholesterol, triglycerides, C-reactive protein and endothelial function. The resulting analysis would show the impact on claim costs relative to the change a given metric or combination of metrics. For example, if the correlation between A1c and claim costs is high, then A1c would be a likely candidate to use as a value-based measure. Figure 1 illustrates the results of an analysis that showed a high degree of confidence that a 2.5 percent decrease in A1c reduces expected claims by \$7,500. In certain cases one metric alone might not be useful, but when combined with others may have value. That is, a moderately high BMI that may not have a significant relationship to claim costs, but when combined with A1c correlation improves significantly.

After measures that best correlate with patient health are identified, the next step is to determine the proportion and duration of the claim savings that can be paid to providers, while maintaining financial stability for the payer. As shown in Figure 1, \$2,000 of the \$7,500 savings was paid to the provider with the remaining \$5,500 available for some combination of premium reduction or increased retention for the payer.¹⁵

BASIS OF MODEL: CHRONIC DISEASE CAN BE REVERSED

One may think it sounds idealistic and unrealistic to provide incentives to make people healthier when so much of health spending is due to chronic diseases, and by definition, these are essentially permanent conditions. Even in the medical profession it is widely believed that once someone has a chronic disease the best outcome possible is achieved through medication compliance and preventive screenings, but even then the patient will still have the condition for the rest of their life. The quality measures currently in place would support this view. As further evidence, even highly respected and well-intentioned organizations dedicated to helping those afflicted with these conditions share this belief. The following statements can be found on the website of the American Heart Association: “High blood pressure is a lifelong condition,” and “Follow [your doctor’s] recommendations carefully, even if it means taking medication every day for the rest of your life.”¹⁶

However, high blood pressure does not have to be a lifelong condition, and taking daily medication for the rest of one’s life is almost always unnecessary if the underlying cause is addressed.¹⁷ The clinical, scientific and historical evidence shows there is a highly effective solution to reverse not only hypertension, but cardiovascular disease, diabetes, obesity, rheumatoid arthritis, inflammatory bowel disease, erectile dysfunction and many other chronic conditions without the use of medications or surgical procedures.

This simple, prompt, safe and low-cost solution is known as whole food plant-based nutrition (WFPBN). While everyone knows good nutrition is beneficial and information on the topic is more widely available today than at any time in human history, this clearly has not resulted in better health. Largely due to a constant stream of new research studies, often focusing on a single food or nutrient, the public and health care providers are confused about what health-promoting nutrition actually is. While WFPBN does involve a specific way of eating, the primary focus should be that for many of the most common chronic and costly conditions, *the human body has the ability to rapidly and safely reverse and eliminate these conditions without prescription drugs or medical procedures when given the correct fuel.* This concept is unknown to a vast segment of the population and many in the medical profession. As evidence, no one would consider buying an expensive car and using the wrong fuel since the connection

between the proper fuel and automobile performance is clear. But many people give little thought to using the optimal fuel (food) in their own body. The connection between food and human health is, at best, ambiguous in an environment where food is often viewed more as entertainment than fuel and many chronic health conditions are thought to be caused by genes or aging. So while it may be impossible to ever definitively settle a debate about the optimal food for the body, as physician Dr. Michael Greger observed, if all WFPBN could do was “reverse our number one killer of men and women [heart disease], then shouldn’t that be our default dietary recommendation until proven otherwise?”¹⁸

UNDERSTANDING WHOLE FOOD PLANT-BASED NUTRITION (WFPBN)

To provide further definition, WFPBN consists of foods made from plants with a minimal amount of processing. Some examples are rice, beans and other legumes, whole-grain products including pasta and bread, potatoes, fruits and vegetables. Excluded are animal products such as meat, dairy and eggs as well as foods containing artificial ingredients or isolated plant components, such as vegetable oils. Over the past several decades we have seen a constant stream of various fad diets, so the question arises, how is this any different? Most importantly, this approach should not be thought of as a diet at all, where short-term changes are made to achieve certain weight goals, but rather a prescription for permanent lifestyle change to optimize health outcomes. While “permanent lifestyle change” may sound drastic, for someone living with a chronic health condition who has already experienced a negative impact to their lifestyle, WFPBN provides an opportunity to take control over their health, which today is often dictated by a battery of pills, many with harmful side effects.

This approach is successful for two primary reasons. First, while many nutritional approaches require participants to eat less or limit calories, which leads to food cravings and is unsustainable long term, a WFPBN approach encourages consumption of as much whole plant-based foods as desired, without counting calories or targeting any exact proportion of carbohydrates, fat or protein. These foods typically have a low calorie density and

The human body has the ability to rapidly and safely reverse and eliminate the most chronic conditions without prescription drugs or medical procedures when given the correct fuel.

provide a feeling of fullness with a smaller number of calories than an equivalent amount of non-WFPBN food. Second, while there may be a perception that WFPBN consists mainly of salads or vegetables, nothing could be farther from the truth. Fruits and vegetables are certainly an important component, but these alone do not satisfy most appetites.¹⁹ Many favorite traditional dishes can continue to be enjoyed on a daily basis. Foods such as burgers, pizza, sloppy joes, mashed potatoes, lasagna and burritos can all be prepared consistent with WFPBN.

RESEARCH DEMONSTRATING HOW WFPBN HAS IMPROVED HEALTH AND REDUCED COSTS

While this approach is not widely used in the medical profession, several physicians have been successfully prescribing it for many years and have provided a wealth of published peer-reviewed research documenting both the significant cost savings and the rapid and effective health outcomes achieved.

Dr. Dean Ornish has treated patients for nearly 40 years with WFPBN and other lifestyle changes rather than drugs and surgery. After reviewing the evidence, CMS concluded this approach was effective because it showed “significant regression” or reversal of coronary atherosclerosis, reduced the need for bypass or angioplasty and led to significant reduction in all of the following cardiac risk factors: (1) LDL cholesterol, (2) triglycerides, (3) body mass index, (4) blood pressure and (5) required medications.²⁰ In addition, Ornish showed that for men with early stage prostate cancer only 5 percent of those who consumed WFPBN required radiation or surgery compared to 27 percent of those who maintained their usual dietary habits.²¹

Dr. Caldwell Esselstyn has used WFPBN to treat high-risk heart patients who had been told by their doctors there was little else that could be done for them. These patients were followed for an average of nearly four years, and of the 89 percent that were adherent, fewer than 1 percent of the patients had a subsequent cardiac event after adopting WFPBN, compared to 62 percent of the patients who started but did not adhere to the nutritional treatment.²² Esselstyn presented his more than 30 years of research findings and the underlying science of reversing cardiovascular and other chronic diseases at the 2017 Society of Actuaries Health Meeting.²³

Dr. John McDougall has used WFPBN as the primary means of treatment for more than 40 years and has had numerous patients with diabetes, obesity, rheumatoid arthritis, cancer and other conditions reverse or significantly improve their condition.²⁴ A study of approximately 1,600 of his patients from 2002 to 2011 showed cholesterol was reduced by 29 percent, blood pressure by 18 percent and triglycerides by 48 percent in only seven days. About 86 percent of those taking blood pressure medications, and 90 percent of those taking diabetes medications were able to reduce or stop them in this short time frame.²⁵

WHY CONSIDER WFPBN TO REVERSE CHRONIC DISEASE?

There are no other documented and scientifically proven drugs, medical procedures or dietary methods that have been shown to address the wide range of health conditions for essentially no incremental cost (everyone has to eat) in such a rapid and effective manner without negative side effects or complications as the approach presented here. Consider that the now routine coronary artery bypass surgery, which has been performed for more than 50 years and is “the most completely studied operation in the history of surgery,” has a complication rate of more than 20 percent, including a 5 percent risk of stroke and 2 percent risk of death, not to mention a significant price tag.²⁶

The first scientific evidence suggesting a link between smoking and lung cancer was published in 1912, and it took more than 7,000 additional studies before the U.S. government confirmed this connection in 1964.²⁷ There will always be those who say more study or evidence is needed, but in this case the goal is not to prove with clinical certainty which specific foods cause certain diseases, but rather to determine the best way to reduce health care costs. For example, in auto and homeowner’s insurance, as there is strong correlation between credit scores and loss experience, the scores are widely used in rate classification even though no one suggests that adverse loss experience is caused by poor credit scores. In this same way, while there can be legitimate ongoing debate about which foods or other factors may cause disease, it is difficult to objectively examine the overwhelming and long-standing evidence of a strong correlation between WFPBN and improved health and decreased costs and conclude anything other than this treatment approach should be made available as an option to all patients, but especially those with or at risk for a chronic health condition.²⁸

IMPLEMENTATION AND PRACTICAL CONCERNS

A key advantage of the Actuarial Patient Value model is it can operate independently of and simultaneously with existing reimbursement systems (including fee-for-service). This allows for more rapid adoption and alleviates concerns that always arise when introducing new methodologies. Implementation of such a model may take some time in the Medicare and Medicaid markets, but commercial and self-insured payers can put these incentives in place very quickly without regulatory intervention or significant capital investment and serve as motivation for adoption by government payers.

While monetary incentives are important, payers must also be prepared to address concerns providers may have about communicating this treatment option to their patients. The belief of many in the medical and scientific community is that because some patients are not receptive to this approach (which is to be



expected), it is not discussed with any patients. As biochemist T. Colin Campbell observed,

We should not be ignoring ideas just because we perceive that the public does not want to hear them. Consumers have the ultimate choice of whether to integrate our findings into their lifestyles, but we owe it to them to give them the best information possible with which to make that decision and not decide for them.²⁹

It should be emphasized that having 100 percent of the population immediately make a change to WFPBN is not realistic, nor is it necessary. The primary goal is to have trusted health care providers simply make patients aware of both the benefits and risks of all possible treatment options. The evidence shows once patients actually try WFPBN themselves, they experience positive and rapid results and have no desire to revert to their prior nutritional habits, with studies cited earlier having adherence rates approaching 90 percent. In fact, many patients express surprise why their prior health care provider had not informed them of this treatment option.³⁰ Once adoption reaches 10–15 percent of the population, most providers will have had a number of patients who successfully reversed their chronic condition. Seeing these results firsthand will, possibly even more so than financial incentives, cause providers to believe in and strongly recommend WFPBN to all their patients. Like any successful innovation, a virtuous circle is created, leading to greater adoption rates over time.

WHY DO ACTUARIES NEED TO GET INVOLVED?

A recent *New York Times* article repeated an unfortunate view of actuaries as “anonymous technicians stereotyped as dull and boring ... as they crunch the numbers for their Affordable Care

Act business.”³¹ Actuaries can forever put this image on the ash heap of history by publicly acknowledging that continuing to “crunch the numbers” in any health care system where reimbursement is not based on the value received by patients is unsustainable. Given their existing skill set, actuaries are uniquely qualified among professions to objectively evaluate the large body of evidence showing treatment using WFPBN results in both optimal health and cost outcomes and from that develop financially sound incentives for providers to offer this option to their patients. Actuaries have a once-in-a-lifetime *opportunity* to make a lasting impact on society by designing a health care model that is based on the most important value patients receive—their health—that can deliver a significant and sustained reduction in costs.

While the medical profession is clearly of vital importance to this solution, it is fitting that actuaries should play a key role because one of the first individuals who brought this concept to the public’s attention more than 40 years ago was not a physician, but an engineer who looked objectively at the existing data and concluded it was possible to reverse chronic disease without drugs and surgery. When Nathan Pritikin was asked what he was doing, he often replied, “All I’m trying to do is wipe out heart disease, diabetes, hypertension, and obesity.”³² Given the even greater evidence that exists more than 40 years later, actuaries, as the chief engineers of financial security programs, should have no less of a goal. ■



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