



The value of actuarial analysis in clinically integrated organizations

By Mark Jamilkowski, FSA, and Alisa Widmer, FSA

Healthcare service delivery and the associated financing of that care are undergoing a revolution, prompted by healthcare reform initiatives and what KPMG believes to be a nonsustainable U.S. healthcare ecosystem. At the same time, technology advancements, including enhanced data storage and manipulation capabilities, allow for the gathering, recording, storing, and analysis of vast amounts of medical data. This combination of events presents a unique opportunity for actuaries, who have historically focused on reconciling and validating information. Conditions arising from healthcare transformation are now favorable for actuaries to change course in working with industry data. If actuaries begin teaming with healthcare providers in both collecting and analyzing data, there is an opportunity for improvements in which data items are gathered and monitored, as well as an opportunity to create new clinical intelligence with value-added actuarial and statistical analyses. The expectation is that these analyses could help elevate the quality and efficiency of patient care and treatment. Additionally, such analyses will be instrumental in managing patient populations in the future.

Contents

The value of actuarial analysis in clinically integrated organizations

Page 1

Managed Medicaid long-term care

Page 4

Challenges of new data and data analytics requirements for health actuaries

Page 6

Historically, actuaries analyze large, normative data sets to create metrics, such as utilization and cost per unit trends. As we point forward, however, what is needed is a better understanding of both treatment success rates and wellness attribution, which result in the creation of statistically driven medical care guidelines or protocols. We believe that actuarial analytical techniques and business knowledge are critical elements to understanding the business and consumer aspects associated with clinical effectiveness. Furthermore, these skills can help physicians manage the volatility or randomness associated with population health dynamics, and help find the predictive indicators that we need as an industry to target root causes behind care delivery variances.

A substantial amount of medical treatment data exists today in the form of electronic medical records, claims data, and other clinical data sources, but this electronic data mostly describe disease conditions, while the treatment details are not standardized and do not provide insight to overall effective treatment or help develop medical practice guidelines. There is a growing need for analytics that go beyond relatively rudimentary medical treatment trends and give insight to population or patient-centric treatments or protocols, outcomes measurement, and disease management. Actuaries have statistical and analytical skill sets that, when applied in collaboration with the clinical knowledge of healthcare providers, can yield greater understanding and more proactive medical metrics. Actuaries are already integrally involved in designing reimbursement methodologies that require performance attribution, and are called upon to develop and price new benefit plan designs. Integrating these principles with clinical analytics can also help providers manage the care-delivery risk associated with the accelerated emergence of value-based reimbursement and can help physicians increase transparency with their patients regarding diagnosis and treatment options. Ultimately, the application of actuarial capabilities to the sophisticated analytics suggested here will enable the data-driven platform for overall population management.

While there are numerous examples to choose from, the discussion below focuses on four diseases to illustrate how actuarial analytics could be leveraged to support the transformation of the healthcare industry. The diseases covered here are obesity, diabetes, heart-related diseases, and dementia.

Obesity

There is ample healthcare treatment data available for obesity. It includes graphs, trend analytics, charts, tables, and analyses of results over time. Trending and observations of the path of service demand are well-documented; however, information on causes as well as the “cure,” defined as weight loss continuously maintained for 12 consecutive months after treatment, is not as well-structured. Current treatment protocols for obesity include combinations of diet, exercise, and/or surgical procedures. Due to the long time horizon for both the treatment and the cure, clinical studies have to adopt a longitudinal approach, with results recorded and analyzed

consistently for an extended period of time. These studies can be combined by actuaries with demographic and other patient background information to create robust predictive models to evaluate treatment compliance and clinical success rates, as well as assist providers in evaluating treatment options and protocols. For example, for a treatment option such as bariatric surgery, an analytical tool could be developed to help determine eligibility, risk factors, and likely effectiveness. Analytics such as this will be required as more provider reimbursement is tied to outcomes, and providers are at risk for the quality and effectiveness of care provided.

Diabetes

Recently, the incidence of diabetes has been increasing at a rate similar to the incidence of obesity, and similar to obesity, a variety of potential medical treatments can be pursued. Medical records and test results over time are required to track a patient’s progress when evaluating these treatment options. Currently, because of the general nature of the subject population, health records may be missing or hard to retrieve or access, which create difficulties in analyzing treatment efficacy. Similar to obesity, there is a need to structure the actuarial analysis over these longer time periods to better understand the drivers of the disease onset as well as the drivers behind patient behavior regarding treatment compliance. Obesity and diabetes are chronic diagnoses, requiring a physician to operate in a clinically integrated care management environment because of longer term treatment protocols and the need to work over a more extended care continuum. The transformation of the industry toward outcome-based reimbursement depends on effectively addressing community health issues such as these.

Heart-related diseases

While collecting data is critical, the form and content of the data being collected are also critical. Heart-related diseases, for example, have many forms and related treatment options, and while electronic medical records help codify some of this information, much of the treatment protocols being followed are recorded on a case-by-case basis. The information can be situational and inconsistent as a result, with detailed data regarding the patient’s medical history but text-based description of specific protocols followed. As a result, it is difficult to determine success rates, failure rates, and complication rates by treatment option. Actuaries can team with providers to standardize data items to be collected in order to create a more robust data set that enables population health management and protocol variance analytics. Advanced data techniques, such as work-mapping and social media applications, that turn unstructured data into statistical values may also be required applications in building this data set. The aggregated data findings can then be used by the provider as a guide to better manage the risks associated with bundled payments or accountable care reimbursement arrangements, as well as create a more transparent decision-making process with the patient.

Dementia

In the United States, increased life expectancy and the growing population of those over age 65 are leading to projections that dementia will become another population health issue, consuming healthcare resources. Thus, dementia is projected to increase in incidence, not as a result of things we are doing wrong, but mostly as a result of things we are doing right. Improvements in medical technology and care management initiatives already in evidence, and the additional quality improvements expected to materialize from reform-based initiatives, can be expected to continue lengthening life expectancy and, therefore, to increase the incidence of dementia. This disease is progressive and long term, and has important implications for the long-term care, nursing and home health industries from a care delivery, and demand perspective. It also has important consequences for the long-term care insurance industry. Actuaries can take the lead in understanding the care demand drivers and population risk factors, as well as in helping the broader healthcare sector find a sustainable way to finance the cost of this emerging health risk. Organizing consistent data-gathering techniques with providers is important, but is only in the early stages

of adoption. Tracking disease state progression, reactions to treatment protocols, and statistical analysis that helps determine where managed care techniques are applicable are also important.

Actuarial analytics and the involvement of actuaries in clinical analysis are at different stages of maturity across the healthcare sector, depending on the organization and the awareness of management to the emerging need to understand care delivery variances and population-driven volatility. As more complex and technology-enabled data opportunities emerge in the transition from fee-for-service to value-based payment, actuarial capabilities will be highly leverageable in optimizing business in the new environment. Actuaries should take advantage of this opportunity to illustrate how value-added analytics can enable and support improvements in healthcare quality and economic attribution and, therefore, support the accelerating transformation to a more sustainable care management system.

For a broader view of the changing role of the healthcare actuary in a post-reform world, see the KPMG Health Actuarial Benchmarking Survey 2011.



Managed Medicaid long-term care

By Tiffany Caufield, FSA

Despite the existence of Medicaid managed care for years, most regulatory activity has been concentrated in the acute care realm, with organizations contracting with state governments to manage the primary and acute services of those eligible for Medicaid. Little activity has gone into the establishment of managed care for long-term care (LTC) services. A few states have pioneered a variety of LTC programs with varying levels of risk bearing by the managed care organization and all manner of benefit packages.

However, budgetary restrictions in most states have heightened the interest in finding viable options to reduce healthcare spending on Medicaid beneficiaries. Nursing home stays account for more than two-thirds of Medicaid spending, even though nursing facility residents only account for 25 percent of the Medicaid population.¹ Given the large percentage of the Medicaid spend dedicated to such custodial care, it is not surprising that states are beginning to consider managed LTC as an option to manage costs.

How does managed Medicaid long-term care work?

Publicly funded long-term care is paid for by two governmental organizations: Medicare and Medicaid. Medicare coverage includes specific short-term stays in a nursing home and some home healthcare after an inpatient hospital discharge. Medicaid coverage includes long-term, custodial stays, home health, and a variety of home and community-based services (HCBS) such as adult day health, Meals on Wheels programs, personal care attendants, and nonemergency transportation. While many nursing home certifiable patients end up in a nursing home, with the appropriate set of services, many can stay at home. This is where managed care can add value.

A typical managed Medicaid long-term care (MMLTC) program works in the following manner. A healthcare provider/organization—typically a health maintenance organization (HMO)—contracts with the state to assume the risk of providing LTC services. The state pays the contractor a flat premium amount on behalf of each beneficiary, and the contractor agrees to cover the contractual LTC costs for that beneficiary. The set of services covered varies from program to program. Some states require that a carrier cover just long-term care needs (nursing home and HCBS), while others will contract with the provider for the spectrum of Medicaid services, including acute and primary healthcare services and prescription drugs. Still other arrangements cover all Medicaid services as well as Medicare services for those beneficiaries that are eligible for both (the so-called “dual-eligibles”).

Because a plan is responsible for all long-term care costs, plans have the ability to redistribute services between care settings: in the nursing home, in an assisted living facility or at a patient's home. Under many plans, services can be arranged so that patients can stay in their homes longer before moving to a nursing home, if that becomes necessary. In almost all cases, receiving benefits at home is much less expensive than receiving benefits in a nursing home.

Consider the Senior Care Options (SCO) program in Massachusetts. This program covers Medicare and Medicaid services for dual-eligibles and emphasizes home healthcare services and care plans to keep beneficiaries out of a nursing home as long as possible. A study of this program by JEN associates found that enrollees were less likely to go into a nursing home, spent more time at home before entering the nursing home, and spent less time there when they eventually did enter a facility for treatment.²

Benefits and concerns of MMLTC

Studies have yet to conclude that there are identifiable cost savings from implementing a MMLTC program despite the shift to lower cost services. Still, MMLTC has several benefits, not the least of which is predictability of Medicaid program costs for state agencies. Medicaid programs can transfer risk to managed care organizations, thereby making their budget much more predictable. In an environment of increasing budgetary constraints, this aspect is quite attractive.

¹ <http://www.kaiserhealthnews.org/stories/2011/february/21/medicaid-managed-long-term-care.aspx>

² [http://www.dhcs.ca.gov/provgovpart/Documents/Waiver%20Renewal/SCO%20Program%20Evaluation%20jun08%20\(2\).pdf](http://www.dhcs.ca.gov/provgovpart/Documents/Waiver%20Renewal/SCO%20Program%20Evaluation%20jun08%20(2).pdf)

Furthermore, MMLTC programs increase the access to home and community-based services, while reducing the utilization of high-cost services, particularly emergency room, hospital, and nursing home services.³ For example, a managed care plan was able to move a 32-year old with severe brain damage due to a motorcycle accident from a nursing home into her own home. To make this possible, a chairlift was installed, and an aide comes to visit every day to assist with activities of daily living. In this case, this arrangement saves approximately \$18,000 per year in long-term care costs.⁴

Additionally, there is evidence of improvements in patient outcomes, including improved quality of life and functional status.⁵ This is not surprising since many managed care beneficiaries have access to HCBS programs that may have been unknown to them prior to joining the HMO, allowing them to stay in their own homes. This is likely a result of the increased accountability associated with MMLTC. In these programs, and unlike fee-for-service Medicaid, the risk is transferred to HMOs, which have an incentive to manage resources efficiently.

MMLTC must still overcome the managed care backlash that occurred during the 1990s. Some opponents are concerned that a managed care plan may limit services to beneficiaries, or that large insurance companies will decrease nursing facility rates, putting additional strain on the nursing home industry, which already operates on small profit margins. For example, in Tennessee, the nursing home industry has encouraged the state legislature to enact a law that prohibits managed care plans from decreasing payments to nursing facilities rates or cutting facilities from their networks.⁶

Operational considerations for plans

Managing long-term care costs is a major change for many HMOs. Carriers new to covering LTC will likely have to expand their networks to include long-term care facilities or alter existing contracts to include custodial care. This poses new opportunities for creative contracting arrangements such as bundled payments (where systems operate hospitals and nursing facilities), capitation, and value-based purchasing. Additionally, plans will have to contract with agencies they may have not considered before in order to ensure that nursing home certifiable patients living at home have access to necessary services, such as visiting nurses, home-delivered meals, adult day health, and so on.

Besides the new agencies, plans will need to consider how well-equipped they are to meet the care management needs of a long-term care population. Smaller community agencies,

such as elder affairs organizations and small, local HMOs are generally more accustomed to managing the care of those that are nursing home certifiable. However, assuming the financial risk of an MMLTC plan is more difficult for these agencies, but easier for large managed care organizations. Small and large organizations can potentially partner, allowing each to take advantage of the other's qualifications.

Policy considerations for states

Since Medicaid long-term care is funded largely through state budgets, states have the most at stake when designing a MMLTC program. And the decisions they must consider cover a wide range of options around enrollment, benefits, and payment methods.

Depending on a state's objective, the selection of benefits can vary widely. States may opt to include only community and institutional long-term care services in the benefit package, while others may include the entire spectrum of Medicaid benefits, including acute and primary care services. The selection of benefits is closely related to the selection of a target population. If the list of covered benefits only includes long-term care services, then it is likely that a beneficiary must be nursing home certifiable to be eligible for the MMLTC program. However, if the benefits include all Medicaid services, then it is possible that all Medicaid beneficiaries are eligible. Alternatively, states may select a population without regard for the benefits available and focus on an area that has the most potential for savings, such as a particular age group or geographic area.

The dual-eligibles represent a unique situation. MMLTC programs will likely include dual-eligible beneficiaries. However, given their additional Medicare eligibility, there are many more opportunities for managed care in this healthcare segment, which we will cover in a subsequent article.

Conclusion

We can expect to see growth in managed Medicaid long-term care programs as state budgets continue to be constrained. To date, six states already require enrollment in MMLTC programs and ten more are growing their managed care programs. Large managed care organizations capable of taking on the risk of these programs should begin to consider how they can accommodate this growing need or team with others to do so.

³ http://assets.aarp.org/rgcenter/il/ib79_mmltc.pdf, pg 8

⁴ <http://www.kaiserhealthnews.org/stories/2011/february/21/medicaid-managed-long-term-care.aspx>

⁵ http://assets.aarp.org/rgcenter/il/ib79_mmltc.pdf, pg 10

⁶ <http://www.kaiserhealthnews.org/stories/2011/february/21/medicaid-managed-long-term-care.aspx>

Challenges of new data and data analytics requirements for health actuaries

By Mark Jamilkowski, FSA, MAAA

The Affordable Care Act (ACA) contains several provisions that are focused on the cost, quality, and access-related issues associated with healthcare delivery and financing. These provisions or initiatives include Benefits Exchanges, value-based or outcome-based care delivery purchasing, risk adjustment concepts, revised/restricted underwriting rules, and increased transparency with additional regulatory reporting requirements such as the Minimum Loss Ratio requirement. Spurred by these initiatives, employers are seeking to establish their own private exchanges, and providers are looking to establish meaningful partnerships that enable better management of care and quality across the care delivery continuum.

These combined initiatives are expected to have a significant positive impact on healthcare delivery and the associated financing of that care. The provisions create a marketplace more focused on the individual, with greater accountability for individual outcomes given to the providers and greater individual consumer purchasing options. The transition away from the employer- or group-focused business model implies insurers will need new competencies and will have to define new roles and responsibilities for themselves that are more retail-oriented. New strategies will be needed, redefining what market segments are being targeted, what strategies can be deployed for market penetration, and what network design and care management strategies they will be required to support.



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Why new data now

The implication for payors of the reform provisions and other initiatives is a fundamental shift in the healthcare marketplace. This shift toward a newly defined consumer-focused market is also creating new risk parameters and challenging the historic value proposition for success for insurers. The new strategic direction that a payor ultimately chooses must be carefully evaluated and vetted, supported by deeper and more broadly defined data analytics. Greater levels of risk management will be needed to adequately measure and monitor value-based purchasing effectiveness, which in turn, rely on an integrated care delivery model with shared financial responsibility between payor and provider, payor and consumer, etc. Actuarial analysis of reinsurance schemes, risk adjustment/pooling setups, models of alternative network design and care management, and product portfolio modeling/optimization will depend on new sources of data. These new data sources can be from exchange portals, consumer interfaces, business partners, and/or clinical data amalgamation, in addition to existing traditional claims data.

It is primarily an actuarial role to analyze this data and provide management with insights. As insurers begin taking on a more collaborative role in the refinement of care delivery protocols, these insights may help isolate the variability in clinical care delivery that often leads to inefficiencies.

Similarly, analysis of the data is needed to help identify the volatility of the cost of care and predict the drivers of cost changes year to year, subpopulation to subpopulation, etc. The population-based healthcare dynamics, such as the interrelationships between income levels, nutrition, and frequency of do-it-yourself home repairs, that drive

healthcare demand and consumer action present new risks and uncertainties, particularly with regard to the current uninsured. Insurers will need to use data to estimate the impacts of the various drivers of healthcare demand as well as interpolate and extrapolate that data in more creative and complex ways in order to better understand the emerging experience.

These analyses opens the door for applications, such as consumer behavior modeling, that banks and other insurers have used to better understand the value principles of the health consumer and their healthcare purchasing decisions. Improved insights into consumer-healthcare decision-making and insurance purchasing drivers can assist insurers in making more effective decisions. These decisions include market segmentation strategies, which are based upon the clinical care needs and the purchasing patterns of these micropopulations, and which also enhance the insurer's relative strengths at managing those co-morbidity risks.

Taking the next step

The healthcare industry is currently facing a variety of questions as it tackles the data analytics challenges described above. What data and data sources (or data partners) are needed, and what are the external and internal interdependencies between providers, payors, regulators, and employers in the use of that data? What are the priority considerations, and how will the decisions made by payors affect or influence other stakeholders' priorities? How will the data sync with the technology and architecture currently in use? Will sourcing, retaining, and storing the data be feasible, and readily accessible? How can nontraditional data, such as word searches of text messages, be structured to be usable and transparent?



The analyzed data must have a purposeful relationship to the overall strategy of the company, and be flexible enough to enable operating-model evaluation. Due to the general lack of enabling technology or tools that could automate data collection and standardize disparate data forms, multiple systems and/or tools may be needed. In situations like this, a dedicated resource, a “data steward,” may be needed to oversee the collaboration of the data needs and uses for all stakeholders, internal and external, and to oversee the development of an integrated reporting tool set across financial, risk, and business intelligence platforms.

Conclusion

In order to influence strategic decision making, the actuarial team and other analytical resources must be liberated from their traditional roles of reconciling and validating claims data. The analytics being contemplated can include, but are not

limited to, complex number theory, multivariate regression, predictive modeling, etc. The analysis must be translatable to strategic key performance indicators and give transparency in the analysis to emerging risks and opportunities. Having a corporate-wide strategic vision specific to data can help drive the associated data collection, storage, and analysis development action steps, as well as the metrics needed to monitor performance.

Transforming the business model is a daunting but necessary task. Having the right data and analytics at hand to support those strategic decisions will be critical. It is a challenge to the payor’s senior management and the actuaries to address how this will be accomplished. KPMG has been assisting its clients identify the data strategies and analytics to be considered in meeting this challenge.

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