

# Financial and Risk Considerations for Successful Disease Management Programs

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**ABSTRACT:** Results for disease management [DM] programs have not been as positive as hoped because of clinical issues, lack of access to capital, and administrative issues. The financial experience of DM programs can be quite volatile. Financial projections that are protocol-based, rather than experience-based, may understate the revenue required and the range of possible costs for a DM program by understating the impact of complicating conditions and comorbidities.

Actuarial tools (risk analysis and risk projection models) support better understanding of DM contracts. In particular, these models can provide the ability to quantify the impact of the factors that drive costs of a contract and the volatility of those costs.

This analysis can assist DM companies in setting appropriate revenue and capital targets. Similar analysis by health plans can identify diseases that are good candidates for DM programs and can provide the basis for performance targets.

Successful disease management companies must address the clinical and administrative aspects of providing the required care to the identified population of patients, and the ultimate test of the success of a disease management contract must be an evaluation of its effect on the quality of care provided to the covered population. While it is critical for a disease management company to provide high-quality care, doing so does not ensure that the program will be successful. Another factor often crucial to the success of a DM company is its ability to evaluate the financial aspects of a proposed risk contract with a health plan. This presents a challenge because costs and utilization of health care services can fluctuate

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greatly, making it difficult to project costs and utilization. These fluctuations can threaten the financial viability of disease management arrangements. The actuarial tools of risk analysis and risk management can provide a basis for making sound management decisions for successful disease management contracts.

This paper introduces disease management risk concepts in general, along with a discussion of risk and financial evaluation considerations, and a brief case study illustrating these principles. The case study and examples used in this paper are taken from cancer disease management contracts, but the basic principles apply to other diseases as well.

## **Description of DM programs**

Disease management programs direct and provide care to individuals with a given disease or set of symptoms, by establishing a group of providers and treatment protocols to ensure that the care required to treat the disease is provided effectively and efficiently. Some DM programs function as components of global health care service contracts. These programs are part of a larger risk

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management program. Other disease management programs are separate contractual agreements between two independent parties. Under such a disease management risk contract, the DM company will agree to provide some or all of the care that the health plan is obligated to provide to its members. These agreements are true transfers of risk. For simplicity, the remainder of this paper is written under the assumption that two separate entities are involved.

A disease management risk contract is fundamentally an insurance contract, because one party is accepting risk for financial outcomes of an unknown future event (in this case, providing care to a group of patients) in exchange for a financial consideration. As a result, the fluctuations in program costs are transferred to the disease management entity.

## **Financing arrangements**

The two traditional forms of disease management contracts are capitation contracts and case rate contracts. Under a capitation contract, the health plan pays the DM company a fixed amount per member, per month. Under a case rate approach, the health plan pays the DM company a fixed amount per patient treated. Some case rate contracts present the rates on a stratified basis, with higher reimbursement for patients with more advanced disease or more complications.

The shared savings approach is increasingly popular. Here, the costs or revenues of the DM company are

subject to performance conditions that usually are tailored specifically to meet the needs of the two parties.

**Goals and objectives**

The health plan and the DM company may have different goals and objectives. The objectives for a plan may include any or all of the following:

- To minimize financial risk associated with high-cost claims.
- To reduce aggregate health care costs by negotiating a capitation or case rate that is lower than the corresponding cost of care provided in its network.
- To simplify and reduce in size or scope the panel of physicians and other professionals, thus reducing administrative effort and the expenses associated with maintaining a physician panel.
- To improve the marketing position of the health plan or HMO by creating a strategic alliance with a regional center of excellence whose reputation for providing high-quality treatment will, in turn, enhance the reputation of the health plan by association.
- To improve its risk-based capital position by transferring risk to the DM company.

The goals and objectives of each DM company vary according to its approach to the market. The objectives of the DM company in negotiating a disease management risk contract can include any or all of the following:

- Maintain a flow of patients and revenue.
- Support treatment in core areas of expertise to improve outcomes.
- Support clinical trials to evaluate protocols or drugs.
- Improve market share by expanding its service area or potential referral network.
- Improve market share by enhancing reputation.

Disease management companies must pay meticulous attention to the clinical aspects of their business, including treatment protocols and provider panel design, because the

program can be successful only if it provides good care. An analysis of a prospective disease management agreement should address not only the clinical issues regarding the screening, preventive care, and treatment of the disease in question and its common complications, but also risk issues.

**Financial risk**

The DM company is accepting financial responsibility for providing the specified care to the patients covered by the disease management contract, and faces the risk that the cost of care will exceed its resources. Fluctuations in utilization or cost of services can cause losses. The DM company should take steps to reduce the potential impact, including:

- Identifying the financial, contractual, and other factors affecting the level of financial risk and the volatility of the risk;
- Estimating the revenue and capital required to accept financial responsibility for the risk;
- Projecting the possible outcomes under different scenarios for factors that influence overall program costs; and
- Managing the risk effectively to ensure that clinical and financial goals are achieved.

**Types of risk**

The major sources of risk in disease management contracts include:

- *Prevalence Risk*: The risk that the population will include a greater than expected number of patients with the disease or condition.
- *Patient-Severity Risk*: The risk that the patients from the population will present at a more advanced stage of the disease than expected.
- *Complication Risk*: The risk that more patients from the population will present with more complicated conditions than expected.
- *Cost Risk*: The risk that the unit cost of services will be greater than expected.
- *Protocol Risk*: The risk that the accepted protocols for treating the disease will change over time

toward more intensive or more expensive treatments.

- *Duration Risk*: The risk that the treatment will last longer than expected. Disease management companies may be victims of their own success. If they can improve survival in the patients they treat, those patients will be treated longer, on average, than patients not treated by the DM company.

These risks are to some extent interrelated. For example, an expensive new anti-nausea drug that allows more aggressive chemotherapy to be delivered to cancer patients with advanced cancer is initially an example of protocol risk. However, the more aggressive chemotherapy may be more expensive than the prior standard (cost risk), and may improve survival, increasing the average duration of treatment (duration risk).

All disease management contracts are subject to other risks as well as the usual risks inherent in providing patient care. These include asset risks (e.g. bond defaults), credit risks (e.g., that clients will be unable to pay bills) and general business risks (fire, theft, inappropriate management decisions, and the like). Although the primary focus of this paper is on the risks associated with patient care, the others should be evaluated as well.

**Contracting considerations**

Disease management contracts vary according to the needs of the parties. In addition to key clinical issues, the contracts should address the following risk issues:

- *Which diseases or conditions are included?* It is important to define clearly in clinical terms the criteria for the covered conditions.
- *What is the financial nature of the contract?* The financial structure of a disease management contract typically will be negotiated to reflect the unique situation of the parties involved. The most common financial options are capitation arrangements, case rate arrangements, and shared savings arrangements. Capi-

tation contracts transfer the risk associated with utilization from the health plan to the DM company, while case rate contracts leave that risk with the health plan. An entity that accepts capitation, therefore, is subject to greater financial risk than a company that accepts case rates for the identical risks, and should be rewarded for accepting that risk. Shared savings contracts can be structured in different ways, and the degrees of risk sharing can vary significantly.

❑ *What population is covered?* Many diseases are more prevalent among older people than younger people. Similarly, some diseases are more prevalent in one gender or the other. The capitation rates for commercial (predominantly under age 65) populations generally are significantly lower than the corresponding rates for Medicare (over age 65) populations. The Medicaid population also differs from the commercial population in age and gender distribution and socioeconomic status.

❑ *Which procedures are covered?* A contract that includes services with low frequency and high cost (e.g. high-dose chemotherapy and stem cell replacement for cancer patients) will have higher risk of significant fluctuations in cost than will a contract that does not include such services. A contract covering *only* such services should be expected to have very volatile costs.

❑ *What is the duration of coverage?* The contract requires a clearly defined beginning and (if applicable) end of treatment for each individual. The criteria can be measured clinically or by time.

❑ *What is the scope of the treatment provided under the terms of the contract?* Some contracts cover only the treatment for the disease and its common complications. Others cover all care to those covered by the contract. If the contract covers only disease-related care, then the boundary between disease-related care and care that is not directly related to the disease, and therefore excluded from the contract, must be

carefully delineated. Complicated boundaries may be difficult to administer, but boundaries that are too simple may lead to disagreements concerning responsibility for treatment.

❑ *Is screening covered?* Screening has advantages and risks for both parties. The health plan may want to increase the frequency and improve the scope of its regular screening, with greater involvement of clinicians specializing in the disease. This advantage could be partially offset by the need to integrate these clinicians and screening services into the health plan's existing provider network. A DM company specializing in a disease that presents serious health risks, such as cancer, may want to control the screening to ensure that cases are diagnosed as early as possible, when outcomes are generally more favorable and total costs of treatment are lower. This may lead to an increase in diagnosed cases in the first year of a contract. Under a case rate approach, this should be an advantage for the DM company, because the additional cases should be diagnosed earlier, and hence be less severe, than average. Under a capitation approach, however, this may be an advantage for the health plan, because the fixed price (per member per month) is independent of the number of cases treated. Because early detection of most conditions is in the best interest of the patients, it is advisable to attempt to create financial incentives to improve screening.

❑ *What service categories are included within the contract?* The contract may cover all service categories, or it may cover only some categories of care (e.g., inpatient services). It should reflect the expertise and efficiency of the two parties, and the responsibilities should be assigned in a manner that allows the best fit to the clinical needs of the patients. In general, good results are achieved when health care services are provided on an integrated basis, so wide coverage is best.

❑ *What providers will give treatment?* The DM company may seek to improve medical outcomes and operating margins by using its own network of facilities, clinicians, and other providers. As an alternative, it may use the providers from the health plan, improving medical outcomes and operating margins via disease management protocols and decision-support systems. The former has the advantage that the DM company has greater control over the care provided. The latter has the potential advantage that the patient's care is better coordinated across categories of care.

The final test must be an evaluation of the likely impact of the agreement on the quality of care provided. For many diseases, timely screening and treatment are essential. Successful disease management contracts provide required care quickly and efficiently and avoid creating barriers to care. A contract that creates barriers to care is likely to have poor outcomes, high administrative costs, and potential public relations problems.

### Benchmarks

An important element of managing the risk is the projection of results required for success. These performance indicators, or benchmarks, serve as the basis for evaluating the success of the contract. Benchmarks allow for comparison of actual results to expected results. The benchmarks should reflect clinical requirements, financial elements, and administrative elements, such as the following:

- Proportion of target population screened (e.g., proportion of eligible women given mammography for breast cancer);
- Utilization by major service category, particularly for those categories of services whose utilization will be reduced if the program is effective (e.g., emergency room visits by asthmatics);
- Cost of care (e.g., cost of chemotherapy per cancer patient treated, by type and stage of cancer); and
- Administrative effectiveness (e.g.,

cost of administrative functions per patient or per dollar of revenue).

The key to managing risk in disease management contracts is knowledge. By understanding the dynamics of the disease and the associated treatment costs, the DM company can make appropriate management decisions.

### Evaluating the contract

Any disease management contract presents challenges to both the DM company and the health plan. The challenges can be financial and administrative as well as clinical. Some diseases (e.g., cancer) with many different treatment pathways and volatile costs present significant challenges. Prospectively, the plan and the DM company should evaluate the risk associated with the contract. This evaluation should demonstrate the potential financial

impact of the program under different scenarios.

### Information technology

Information technology is necessary for risk evaluation. Both the health plan and DM company should build the capability to assess both clinical measures of success (e.g., percent of diabetics receiving annual retinal exams) and financial measures of success (e.g., costs per patient by risk level). The evaluation of the results also should involve clinicians, since the payback for some preventive services, such as retinal exams for people with diabetes, may be deferred beyond the observation period.

### Financial risk models

One mechanism for measuring and managing risk is a financial model. These models permit the

evaluation of the potential impact of key risk factors on the overall cost of a program or on the range of reasonably expected results. Volatility analysis can show the effect of risk factors separately and in conjunction with other factors. Financial models can be simple or quite complicated, and the additional work to create complicated models usually permits more sophisticated evaluations that include more factors that influence program costs.

As an example, a financial model for a cancer management program could reflect the following factors:

- Distribution of covered members or patients by age, gender, geography, or other factors important to the disease in question (smoker/nonsmoker for lung cancer, e.g.);
- Prevalence of cancer in each population cell;
- Distribution of newly-diagnosed cancers by tumor/node/metastasis (TNM) stage;
- Survival rates by stage and population cell;
- Treatment protocols and frequencies of service by cancer stage;
- Provider delivery system composition;
- Reimbursement methodology;
- Presence of complications and their treatment costs;
- Baseline benchmarks for utilization and costs;
- Technology shifts and evolution of treatment protocols; and
- Changes in duration of treatment.

Such a model could estimate the potential volatility caused by secular changes (e.g. cost inflation, population aging, etc.), specific combinations of adverse assumptions, or random fluctuations.

### Reinsurance

Another mechanism for managing risk is reinsurance, which can limit the potential adverse financial effect of the risks associated with a DM contract. The DM company may negotiate a reinsurance contract with the health plan or a reinsurance company that limits the effect of a single patient, or a contract that limits the

## Evaluation criteria

*Both the health plan and the DM company also should periodically evaluate the emerging results of the contract. Health plans should evaluate the results under several criteria:*

- Are the outcomes under the capitated contract consistent with clinical goals for patient treatment?
- Has the delivery of care been consistent with best-observed practice?
- Are the costs of the program meeting the financial targets?
- Are patients satisfied with the program?

*Disease management companies should evaluate the programs that they negotiate under other criteria:*

- Did the membership and revenue meet or exceed the projected levels?
- Was the contract profitable?
- Was utilization by service category consistent with treatment protocols?
- If it was a capitation contract, was the number of cases consistent with the levels assumed in setting the price? Was the distribution of cases by severity level consistent with the distribution assumed in setting the price?
- Under either a capitated or case rate contract, was the cost per case treated consistent with pricing assumptions?
- Under a shared savings contract, were the savings as measured under the terms of the contract consistent with the expected levels? With independent assessments?

effect of all patients combined. Either approach can help a company manage the amount of risk it assumes, keeping the level of potential losses within manageable levels. Note that the presence of a DM contract should reduce the potential need for (and cost of) reinsurance for the health plan, since the volatility associated with these patients has been transferred to the DM company.

**Regarding revenue**

*General formula*

Evaluating the revenue requirements (excluding administrative costs) of health risk contracts in general can be summarized by this formula:

$$\text{Estimated revenue requirement} = \text{frequency} \times \text{intensity} \times \text{cost}$$

Frequency describes the number of times an event will occur per unit of population, usually expressed as an annual frequency per thousand. For hospital inpatient, frequency can be the number of hospitalizations per thousand persons per year. Intensity refers to the complexity or volume of services per episode. For hospital inpatient, intensity can be the length of stay (LOS). Cost refers to the per-unit cost for the health care service. For hospital inpatients, this can be the per-diem charge.

The DM company should ensure that its prices reflect not only the historical costs associated with providing care, but also reflect trends in the expected cost for current treatment, and margin to cover unexpected increases described above. Margin for administrative and overhead expenses should also be included.

**General considerations**

The process of estimating revenue requirements to support negotiations for a particular contract requires that the DM company develop assumptions for each component of the revenue formula. Those assumptions quantify the projected levels of prevalence of each type of patient, and the frequency, intensity and unit

cost for providing health care services to those patients. These assumptions generally are made separately for each pricing factor (e.g., hospital admits and length of stay), for each service category of care (e.g., hospital inpatient, physician office visits, pharmacy) and then summed across service categories and patient types to determine the total cost.

The price that emerges from the process described above may or may not be acceptable to the potential client. If the negotiated price required to “close the deal” is less than the rate based on the experience-based rate, then the DM company needs to reevaluate the assumptions that led to its development. These may include:

- Scope of contract;
- Provider reimbursement rates;
- Impact of protocols;
- Levels of, and trends in, costs and utilization;
- Changes in treatment protocols over time;
- Utilization of services; and
- Administration and profit charges.

**Case rate contracts**

The above formula works well for developing case rates for many disease management contracts. In estimating the revenue requirements of a disease management contract, the elements of the calculation should reflect the specifics of the disease, the delivery system, and the population covered. For example, the formula used to estimate the costs associated with a case rate cancer risk contract should be specific to cancer patients for the frequency, intensity, and cost-per-service assumptions in the pricing formula.

Each specific disease presents unique challenges. Cancer case rate contracts are guarantees that the DM company will provide required health care to cancer patients for a specific price. This type of contract transfers the risk of increases in treatment costs from the health plan to the DM company. This risk transfer deserves careful analysis, because

cancer-care costs have tended to increase faster than costs for health care in general.

**Capitation contracts**

Capitation contracts guarantee not only the price per patient, but also the prevalence of the disease in the covered population. Even common diseases covered by disease management contracts can be expected to produce varying levels of prevalence, caused only by chance statistical fluctuations. Relatively uncommon diseases will produce greater fluctuations.

For capitation contracts, where the required revenue is calculated per member per month rather than per patient, it is helpful to express the formula as:

$$\text{Estimated revenue requirement} = \text{prevalence} \times \text{frequency} \times \text{intensity} \times \text{cost}$$

As used above, prevalence refers to the proportion of the membership receiving treatment for a particular condition.

In developing a capitation rate for a cancer disease management contract, it is important to recognize some factors that will affect the assumptions used in calculating the capitation rates:

Prevalence (people having the disease and being treated for it) and incidence (people diagnosed with the disease) are not interchangeable, because of the time required to provide treatment. For example, consider a cancer that requires six months of treatment. The patients treated under a contract spanning a calendar year will include not only those diagnosed during the year (i.e., 100 percent of those who are counted to determine the incidence rate), but also those diagnosed during the last six months of the prior year (approximately half of those counted to determine the prior year’s incidence rate, recognizing mortality and migrations in and out of plan).

Thus, the prevalence rate would be approximately 150 percent of the

incidence rate, if treatments require six months and the population were stable.

**Shared-savings contracts**

For shared-savings contracts, estimating revenue and projecting costs becomes more difficult, and should be tailored to the specifics of the contract. First, the performance criteria and the other key features of the contract should be negotiated. Once these are agreed on, they are the basis for measuring “savings.”

Shared-savings contracts present additional challenges. The very name implies a belief that savings will occur. If the DM company can deliver care of equal quality more efficiently than the health plan, there will be savings, compared to what the health plan would have been able to achieve. The risks associated with DM contracts (prevalence, utilization, cost, et al.) still exist, and are borne by one or both entities.

**Practical considerations**

Evaluating the revenue required to support a DM contract frequently reflects the historical clinical and financial results of both the health plan and the DM company. Evaluating the prior financial experience of the health plan will help to quantify the impact of the population on the utilization and cost per service (e.g., geographic and behavioral factors, such as smoking, diet, and exercise).

Evaluating the historical financial and clinical experience of the DM company is important if the protocols, reimbursement basis, or provider network will be different from the health plan. The DM company should estimate the effect of changes in protocols, provider panels, reimbursement and incentive methodology, and other factors on the experience of the health plan.

**Case Study: Cancer DM**

**Issue 1: Estimating a Case Rate for a Disease Management Contract**

Consider a proposed cancer carve-out contract between a health plan

and a cancer-management company. For simplicity, we will restrict this example to the following:

- Medicare population only (>65), 25,000 members;
- Colorectal cancer only;
- Calendar year case rate basis (one year renewable), with no incentive provisions;
- One location only (New Haven/Bridgeport, Conn.);
- Effective date Jan. 1, 2000;
- Cancer care only (i.e., excluding care for non-cancer treatment);
- Covered services based on a typical Medicare risk contract;
- Charges based on Medicare’s allowed reimbursement levels;

As described above, the calculation for a case rate includes:

- Frequency (F): the utilization of each type of service per thousand patients;
  - Intensity (I): the relative cost for each type of service; and
  - Cost (\$): the absolute unit cost.
- For simplicity, this analysis ignores administrative and profit charges.
- It is important to reflect the expected utilization and cost per service of the contract. In this example, the unit costs for services should be revised to reflect Medicare reimbursement levels for the network providers in the New Haven/Bridgeport area for calendar year 2000. Other contracts will have different reimbursement and incentive methodologies, and the unit costs and utilization of services should reflect the characteristics of those systems.

The prevalence of patients actively treated for colorectal cancer in the Medicare population is approximately 6 per 1,000 members. Therefore, the expected value for the number of colorectal cancer patients in our population is 150 (= 25,000 members x 6/1,000). If the group of recent colorectal cancer patients were a homogeneous population, this would be a large enough sample size to evaluate the revenue requirements of this contract. However, differences in stage at diagnosis, treatment protocols, survival, duration since diagnosis, underlying

comorbidities, and other factors will cause fluctuations and uncertainties in actual experience and in projections based on that experience, so supplemental data should be considered.

The development of the projected case rate for this contract was based on data from the Health Care Financing Administration’s 5-percent sample of Medicare claims. The process used was as follows:

1. Identify patients in the sample with colorectal cancer, based on diagnosis codes and procedure codes.
2. Analyze the care provided to those patients to identify cancer treatment.
3. Evaluate the completeness and accuracy of the care and cost data against external sources.
4. Assign the care to service category (e.g., hospital inpatient).
5. Summarize the care by service category and patient.
6. Adjust the utilization and unit costs to reflect changes in treatment protocols (such as new radiation therapy techniques or chemotherapeutic agents), changes in duration of treatment, changes in distribution of diagnosed cases by TNM stage, or other secular trends or differences between the source data and the intended population.
7. Calculate utilization, resource-based relative value units (RBRVS) and per-unit costs by service category, based on the number of patients.
8. Adjust the case rates to be appropriate for the New Haven/Bridgeport area, using the appropriate conversion factors.
9. Adjust the case rates to reflect the specifics of the contract and the population covered.

For this contract, the actuarial cost model in Table 1, Page 64, reflects the “best estimate” of the utilization and average cost per service, and the per patient per year (PPPY) claim costs.

**Issue 2: Projecting the range**

The model described in Table 1 presents the expected costs associ-

ated with treating colorectal cancer in a Medicare population in the New Haven/Bridgeport area, \$17,263 per patient per year. However, there can be significant variations in the costs per patient. These can be evaluated by creating a financial model that reflects the important risk factors described earlier.

As described above, the expected number of patients from the 25,000 covered members is approximately 150. The average calendar year cost per case is \$17,263, so the total expected cost is \$2,589,441 per year (150 cases per year times \$17,263 per case). A range of outcomes is possible for both the number of patients and the annual cost of treating those patients. Based on the prevalence of 6 patients per 1,000 members, for example, we can project that 90 percent of the time, the number of patients out of 25,000 members will fall between 130 and 170, with the expected value being 150. This interval (130 patients to 170 patients) is referred to as the 90-percent confidence interval, because 90 percent of the results are expected to fall within it. This suggests that once in every 10 years the number of patients will fall outside this interval, either more than 170 or fewer than 130. Because this contract is on a case rate, rather than a capitation rate, the carveout company is not at risk for fluctuations in the number of colorectal cancer cases. The HMO should recognize that the number of patients treated would directly affect its costs.

The distribution of patients being treated for colorectal cancer by their annual cost of treatment is shown in Chart 1 on Page 65.

Both the HMO and the cancer carveout company may use an "average" case rate to evaluate the contract, but they also should consider the fluctuations that are possible under the new contract. For the health plan, this should be a positive, because it is passing along the risk for high-cost treatment. For the DM company, this is a source of financial risk. Table 1 shows an "average" rate

of \$17,263. Based on this distribution of costs, it is possible to determine confidence intervals for the case rate. These confidence intervals are illustrated in Table 2 on Page 65.

As shown in Table 2, the expected annual cost for treating 150 cancer patients is \$2.6 million (= 150 patients times \$17,263 per patient per year). The 90-percent confidence interval for the annual cost is \$2.2 million (86 percent of \$2.6 million) to \$3 million (114 percent of \$2.6 million). That is, for a population of 150 patients whose claims distribution matches the distribution shown above, the average claims per member will fall between \$2.2 million and \$3 million 90 percent of the time, or 9 calendar years out of 10 on average. The other 10 percent of the time the costs will be below \$2.2 million or above \$3 million. This is the amount of fluctuation caused only by random variation in annual treatment costs per patient.

The DM company may not have the capital to withstand fluctuations of this magnitude. This problem can be addressed by different ap-

proaches, including:

- *Growth*: Adding lives reduces the random fluctuation of risk, relative to revenue, as shown in Table 2. Note, however, that additional capital is required to fund growth in risk. The advantage of growth is that the required capital increases less rapidly than revenue should increase.
- *Contracting*: Some of the cost risk can be transferred from the DM company to providers by case rate or similar arrangements.
- *Reinsurance*: Ceding the risk to another entity reduces the range of potential losses, but also the expected profits for the DM company.

Note that there are additional sources of fluctuations in total annual costs. Some of the fluctuation is caused by patient characteristics (i.e., TNM stage at diagnosis); some of it is caused by treatment choices. Complications and outcomes also cause some of the differential (since treatment is ended at death). Thus, while a calendar year case rate approach to cancer carveouts eliminates some financial risk for the DM

TABLE I Per patient, per calendar year case rate.  
Colorectal cancer patients in Medicare (over age 65) population  
New Haven/Bridgeport, Conn.  
Center date: 7/1/2000

Service type	Annual utilization per patient	Cost per service	Case rate per patient per calendar year
Hospital inpatient	0.7	\$16,650	\$10,842
Hospital outpatient	2.5	263	646
Physician; surgery	4.3	360	1,554
Office visits	7.0	38	268
Chemotherapy	8.5	118	998
Radiation therapy	1.7	154	263
Miscellaneous	17.3	56	969
Pathology	18.4	30	552
Prescription drugs	25.6	16	419
Other (hospice, home health, ambulance, DME, etc.)	2.0	377	752
Total	88.0	\$196	\$17,263

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CHART I Colorectal cancer patients, Medicare (over age 65) population  
Percentage distribution by annual treatment cost

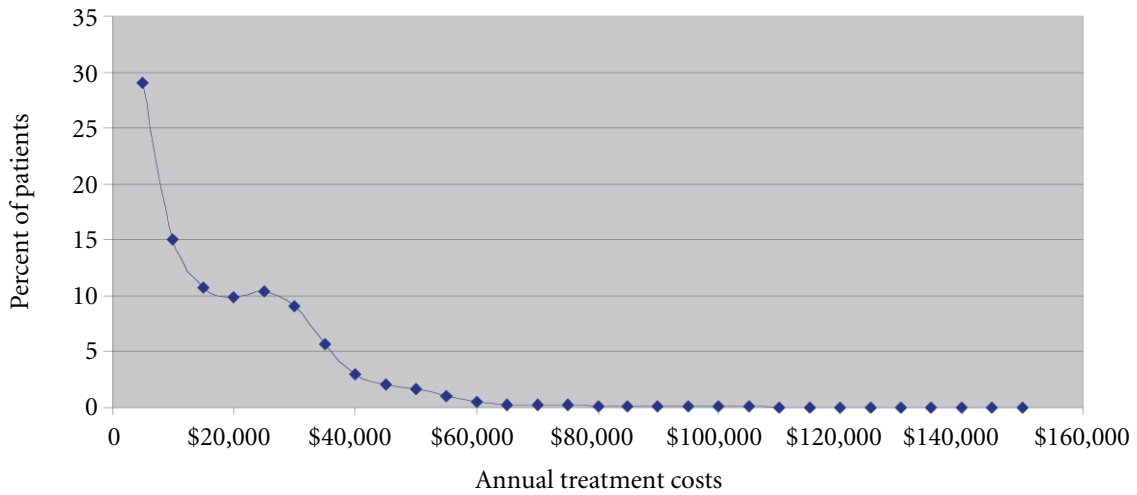


TABLE II Scenarios for colon cancer treatment.  
Confidence intervals by number of patients.  
Medicare population, center date 7/1/2000.

No. of Patients	Annual cancer treatment Costs (\$thousands)	Annual cancer treatment costs (Percent of expected)	90% Confidence interval (Percent of expected)		90% Confidence interval (\$thousands)	
			Low	High	Low	High
50	\$863	15%	75%	125%	\$649	\$1,077
100	\$1,726	11%	82%	118%	\$1,423	\$2,029
150	\$2,589	9%	86%	114%	\$2,218	\$2,961
500	\$8,631	5%	92%	108%	\$7,954	\$9,309
1,000	\$17,263	3%	94%	106%	\$16,305	\$18,221
2,500	\$43,157	2%	96%	104%	\$41,642	\$44,672

company, it does not eliminate all financial risk associated with the negotiated contracts.

The carveout company may not be subject to financial risk caused by the number of patients, but fluctuations in the cost of treating each patient may still cause adverse financial results.

**Conclusion**

Disease management programs offer health plans the potential for improved return on invested assets by

reducing required risk capital and by improving the efficiency of the delivery of care, while at the same time improving outcomes for patients.

In addition, a disease management contract provides health plans with the opportunity to link their company name to that of a regional center of excellence, recognized for its current expertise in treating the disease. The DM company has the opportunity to increase its market exposure and patient base, ensuring a flow of patients.

The contract also creates the opportunity to improve earnings for both parties, by allowing each to focus on providing care that each does best. As may be seen from this discussion, however, there are significant issues regarding the scope of the negotiated agreement, and both parties should conduct a thorough evaluation of the expected health care financial experience before entering into a disease management contract. **MC**