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WELLNESS/HEALTH STATUS

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- Impact of wellness programs on medical plan experience/non-medical plan experience
- Health status as a pricing variable -- trends, legal implications
- Likely future developments

MR. DAVID F. OGDEN: Health status is an attempt to measure the effect of the factors influencing a person's health, in comparison to an average individual of a given age. One way of measuring health status is using a Health Hazard Appraisal, or a Health Risk Profile. The Health Risk Profile asks a series of questions regarding an individual's health, living habits, and medical history. Health Risk Profiles were developed as a basis of measuring mortality risk, rather than morbidity. One of the results from the Health Risk Profile of an individual is an estimated risk age for the individual. After an analysis of the Health Risk Profile, the risk age would be an estimate of the mortality characteristics of that individual. An individual's mortality would be compared to the mortality of a "normal" individual of that given risk age.

Approximately two years ago we learned that Control Data Corporation was maintaining a data base on its own employees that would allow a comparison of the employees' medical costs to their health status. Control Data has a subsidiary called STAYWELL, which promotes wellness. STAYWELL sells programs to employers which can be used to try to improve the health

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characteristics of individuals. For example, these programs could include: weight loss programs, smoking cessation programs, exercise programs, etc. One element of the STAYWELL program is to have a Health Risk Profile taken of all participating employees.

Control Data also offers the STAYWELL program to a large number of its employees. Control Data self-insures and self-administers its health care program. This combination provides available data showing both an individual's health status and medical cost experience. Since the Health Risk Profile analyzes mortality risks, which are not directly related to morbidity, the health-risk age I mentioned before was not used. Control Data reviewed different health characteristics, highlighted by the Health Risk Profile, which could be used to separate the population into different medical cost risks.

After extensive study, Control Data determined seven largely behavioral characteristics which affected medical costs: exercise, weight, smoking, hypertension, drinking, cholesterol and seat belt usage. Each one of these characteristics was separated into low, medium and high risk levels. The separation into the three risk levels was based on medical criteria. Each of the seven categories described can arguably be said to be behavioral characteristics. Individuals have control over each of them, although genetic characteristics could come into play in some cases.

By examining the data according to the seven behavioral characteristics the Health Risk Profile has been used to obtain morbidity differences. As I indicated earlier, the Health Risk Profile was developed to measure mortality differences. The data available from the Health Risk Profile was used to discover characteristics which have an effect on morbidity. The data base could then be researched to determine what variations in morbidity levels were caused by the seven characteristics.

Thus, a substantial data base is available to study medical cost differences due to these behavioral characteristics. The data is available in a large amount of detail. Costs can be separated by 1) Different types of service: e.g. hospital inpatient, hospital outpatient, surgery, radiology, etc., 2) sex, 3) age, and 4) claim size.

Control Data found that the experience should be separated into age and sex cells to best interpret the cost differences between the different risk levels of a particular behavioral class. They looked at cost differences among 1) males under age 40, 2) males over age 40, 3) females under age 40 and 4) females over age 40. The variations in cost between the low, medium, and high risk levels of a particular characteristic could be obscured if age and sex separation was not made.

Milliman & Robertson and Control Data have begun a joint venture to analyze this data and determine how it could be used for insurance products. We have received the summaries of the Control Data data base, and have just begun the analysis. After our analysis, we expect to publish a research paper which will summarize the initial results. The paper would also outline who potential users of the data might be, what limitations the data has, and what future research could be done with it. Assuming that the results seem reliable and usable, we expect to continue this research to develop a detailed rating structure which can be used to develop detailed insurance products.

Some of the results are as expected. Medical costs would increase from low risk to high risk for: exercise, smoking and hypertension. There is a spread of about 15% from low risk to high risk. Several characteristics show mixed results. For both weight and cholesterol the medium risk is the lowest cost. For drinking, the high risk group has the lowest cost.

In several cases there were distinctly different age/sex factors by risk level. In four characteristics the age/sex factor increases from low risk to high risk: exercise, weight, hypertension and cholesterol.

It is too early to say if there are clear differentials by type of service. In many cases, hospital inpatient costs show a clear increase from low risk to high risk categories, as one would expect.

The results for drinking are the opposite of what one would expect -- the high risk category has the lowest cost. There are a number of factors which probably affect this outcome:

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1. Only 2% of the population is high risk

2. The category is predominately young male

3. There is an inherent bias in the drinking category

   a. People are reluctant to report they have a drinking problem.

   b. There is a tendency among heavy drinkers to hold things together until the end. Thus many medical problems are not reported until a final collapse occurs.

There was some additional interesting information available on Control Data employees. We received an age/sex distribution of employees separated by whether they were members of an HMO or not, and whether they had a Health Risk Profile taken or not. There was no significant difference due to age/sex between the non-HMO employees who had taken a Health Risk Profile and those who did not. HMO employees were somewhat younger.

We also reviewed a distribution of employees with a Health Risk Profile by the differences between risk age and chronological age. Two conclusions are apparent:

1. There is no significant difference between HMO employees and non-HMO employees.

2. 60% or more of the most extreme risk categories (risk age minus chronological age is less than -7 or greater than +7) are made up of individuals under age 30.

How could health status be used in the insurance industry? I see a wide range of possibilities. The information could be used by any risk taker -- for example: insurance companies, Blue Cross/Blue Shield plans, HMOs, self-insured employers -- to determine medical cost differences in classes of employees. Employers could base their premium contributions on a medium or low cost lifestyle, but vary the premium by health status. HMOs could measure the

health characteristics of patients assigned to a particular physician to improve evaluations of the performance of that physician.

The use of health status in premium calculations should be fairly straightforward. Health status could become another rating variable along with age, sex, industry, geographic location, etc. Most situations would probably not warrant using all seven of the behavioral characteristics. It is likely that only one or two of these characteristics might be used initially. Some insurance companies currently vary premiums between smokers and non-smokers in the individual and group market.

In 1985, the State of Kansas asked for quotes on premium coverage for its employees, who would be separated into smokers and non-smokers. Many employers have limited or banned smoking in the workplace. An additional way to encourage individuals to stop smoking would be to increase an employee's premium contribution if the employee smoked.

Special steps may need to be taken to ensure that employees can be accurately classified. Most of the seven behavioral characteristics can be verified through a medical test, if necessary. Over-weight, smoking, hypertension, drinking and cholesterol levels can be verified. Exercise and seat belt usage are somewhat more difficult to do. Still, the use of the characteristics as rating variables will be controlled by administrative limitations.

Employers could base their contribution level on an average risk and require higher risk individuals to pay the extra cost associated with that status. This idea is not unlikely given the strong emphasis on saving money. The employer would be saying that an employee can engage in certain habits which are likely to increase medical costs, but the employer will not be willing to pay for these additional costs.

There seems to be a strong movement in this country away from certain traditional actuarial rating variables. People complain about the use of valid predictors of costs which are arbitrary and beyond the individual's control. It appears that sex is on its way out as a rating variable. It is possible that age will also be attacked. However, the seven characteristics that I have

mentioned are all within the control of the individual. These characteristics are not beyond an individual's control as age and sex are.

There is an increasing emphasis on a healthier work environment. Smoking has been banned in many workplaces. There seems to be an increasing emphasis on exercise, healthy diet, and wellness in general. Health status is a tool which, when available, can be used to accommodate these pressures that the market is exerting.

Health status can be used to measure the performance of individual providers in an HMO or PPO. Currently, many HMOs set up separate pools, for groups of physicians or individual physicians. The medical cost targets for these pools are frequently varied based on the age and sex of the individuals. Physicians have been known to complain that "my patients are sicker than the average patient." Data on health status could be used to adjust the medical cost targets set for a given pool.

It may be easier for an HMO to use this data than in any of the other situations cited. Since an HMO is a combination of medical care and insurance, an HMO has access to medical records which can be used to obtain health status data. Health status data could become a standard part of the initial enrollment procedures and periodic physical exams.

I am going to give a simplified outline of a rating structure, developed for a broker to use for members of professional associations:

1. Four health status categories were developed based on the difference between an individual's chronological age and risk age. The risk age was determined from the Health Risk Profile. The four categories used were:

Category	*Risk Age Minus Chronological Age*
Super-Select	-7 or less
Select	-3 to -7
Standard	-2 to +2
Substandard	+2 or more

Clearly, the lower an individual's risk age is when compared to the chronological age, the better the risk that individual should be. The reverse is true when the risk age is greater than the chronological age. We have two categories that are better than average, and only one that is worse than average, to provide incentives for individuals to obtain a Health Risk Profile. It is anticipated that individuals who have greater than average costs are less likely to participate in this program. The Standard category roughly corresponds to the premium rates before the health status adjustment was added.

2. Each individual would have to take the Health Risk Profile. The Profile involves answering questions, with some necessary medical tests to ensure a complete and accurate response. If an individual did not take the Health Risk Profile in the first year he would be rated Standard. If that individual continued to not take the Profile, then he would be dropped to Substandard in succeeding years.

3. In the first year an individual would be eligible for only two categories, Standard and Select. No one would be rated Substandard, even if his score so indicated, to encourage each individual to use the Health Risk Profile at least once. People were started in the Standard category to provide an incentive to take the Health Risk Profile. We felt that if they were rated Substandard in the first year, some individuals would choose not to take a profile because they feared negative results. Correspondingly, the Super-Select category would not be available to avoid employers having to give a significant discount based on only one year of data. Thus, individuals scoring Super-Select or Select would be given a Select premium, while individuals being rated Standard or Substandard would be given a Standard premium. Anyone who did not use the Health Risk Profile would be rated Standard in the first year.

4. The Health Risk Profile would be expected to be completed each year. Rules would have to be set up governing how individuals could move from one category to another. We proposed a limitation that individuals could only move up or down one category in future years. A matrix would be developed, with the current category as the columns of the matrix and the

new Health Risk Profile rating as the rows of the matrix. Individuals would be raised or lowered a category based on the results of their current Health Risk Profile.

Consideration must be given as to whether the one category limit we recommended is appropriate in all cases. The possibility of dropping more than one category may be desirable, but an increase of more than one would not. For example, you may want to make it possible to go from Super-Select to Standard in a year, but not from Substandard to Select. It seems likely that an individual's health status could erode rapidly, but a significant improvement would require two or more years to indicate permanence.

5. Since we recommended using only Select and Standard categories in the first year, there would be insufficient premium collected since there are no Substandard rates to offset the Select rates. It would be very important to model the potential distributions of applicants among the Health Risk categories in order to determine premium losses in the first year and premium increases in later years. The company would need to know what the potential cash flow requirements will be.

It would be important to monitor the experience under the additional rating variables because there may be additional administrative costs involved in a program such as this.

I hope this gives you an idea of how health status could be used in an insurance product. This is a very challenging concept whose "time has come" in the insurance industry. I expect that in the next few years we will all be involved in developing products which make use of this kind of information.

MR. KEVIN MCCARTHY: I work for a company called General Health that gets classified consistently as being in the business of wellness. Over the last three or four years, there has been a meteoric rise in the cost of health care. Wellness is nice, but the bottom line when dealing with corporate America is: Cost containment is the driving force. The business that everyone

is in is putting wellness to work in containing costs. We have seen a move away from retroactive or reactive kinds of cost containment. Short-term approaches that were initially discussed in 1982 -- second surgical opinion and preadmission testing, for example -- have given way to greater emphasis on longer-term wellness programs such as worksite conditions, health promotion and screening.

General Health does a lot of business with large corporations and insurance companies. A traditional view of the insurance market, looking at coverage and benefit design, is to contain costs while slowly moving to total benefits management. That might be demonstrated in the rise of flex programs, or cost analyses that include productivity, workers' compensation and total cost per employee, rather than just health care costs. We see a movement towards looking not only at illness costs, but at absolute work force costs, resulting in a total view of corporate health risk management or loss control.

There are a number of factors that go into risk management: risk exposures to be evaluated, high risk categories to be identified, risk control programs to be implemented and all programs to be financed. A traditional view of the health management system looks at the employee's standpoint of obtaining medical care, with the result being claims. A more current, prospective view might be to look at the risks associated with each individual employee, evaluate the data associated with those risks, and incorporate the results into a comprehensive risk management program that can be budgeted for.

In a traditional environment, the employee utilizes the health care system, which results in claims activity. More frequently you now see companies in the business of analyzing excesses in claims activity: excess services, excess disease, excess charges. Results are cost containment plans that change the benefit design, implement provider controls, contract with providers and explore alternative delivery systems. Claims analysis might flow along the lines of comparing claims data in an individual and an aggregate sense against norms, and then trying to identify which categories of claims need to be controlled. We might contract with lower cost providers, or move from one hospital to a more cost effective facility.

The part of the equation left out is the "not as sick" employees, who have not generated a lot of claims activity. We need to understand what risks are associated with those employees because sooner or later they are also going to generate claims activity. Risk estimation is the collecting of risk data, aggregating it into a data base, and determining what kinds of costly medical results are likely to occur. Overall risks of morbidity and mortality can be measured, as well as specific risks such as: cancer, heart attack, or accident. The same kinds of risks that result in rating factors are applied to claims data.

In evaluating risk there are a few things to do. First, look at basic claims activity of the past. Second, look at demographic data about the population. One of the things which results from an analysis of risk is an estimation of where claims are likely to occur, as compared to where they have occurred historically. There is relative tracking between what we in the risk estimation business might see, and what you in the actuarial business might see: cardiovascular disease being significantly the number one cause of costs; muscular disorders -- in the back ailment area -- being number two, and so on.

Risk estimation goes beyond evaluating what risks there are; it actually collects data, describes chances of becoming ill or dying from very specific causes such as heart attacks, and quantifies the amount of *modifiable* risk. In a generic risk estimation model, information is collected about the individual and run through an algorithm comparing that individual's data to population data, and against average risk data collected from such studies as the Framingham Heart Study, National Health Statistics, etc. That individual's risk can then be estimated, aggregated into a risk estimate for the entire group, and a plan can be implemented for that group -- whether the group is an employer population or an insurance company's pool of business.

The application of algorithms results in a score which compares the person's chronological age with a health age, or an attainable risk level. This estimates the difference between your current risk and what could happen if certain risk reduction programs were put in place to change your life expectancy and/or your morbidity risk. So we try to estimate the gap in terms of cost and incidence between current risk and attainable risk over time. The costs of

reactive programs and proactive programs can be compared. Reactive programs would be things such as utilization management or managed care. Proactive programs are the "soft" programs such as weight control, hypertension control, smoking cessation, etc. -- programs that we have had trouble quantifying, and consequently, which corporations have resisted investing in.

The typical question is whether or not to become involved with wellness and with employee health promotion. The costs associated with a promotion are clear, the returns are difficult to quantify. So, if we are interested in cost containment, how can we spend more money on health promotion?

Risks associated with the *currently* "not-as-sick" employees are areas where corporations have neglected to spend enough time, money and effort to control them. However, corporate risk managers are quite familiar with managing the risks associated with casualty loss. These include safety requirements, insuring and protecting equipment, and bonding employees. Health risk management is the application of loss control techniques to the costs and risks of employee health. With health risk estimation models and tools, the factors likely to be associated with costs as a result of individual employee health risks can be identified: blood pressure, cigarettes, Type A behavior, cholesterol levels, attitudes towards health. Once those risks have been identified, a plan that balances traditional cost-containment management of utilization behaviors with risk management of health behaviors can be put in place.

There are many applications of health risk management. For example, we can build models for HMOs and other managed care systems to apply risk estimation. With this application, we manage the care of an individual patient through the health care system with an eye on costs. Once we have collected demographic and risk data, we determine the relative risk level (high or low-risk) of the employee/patient. If the person is low-risk he can be directed into a preventive health mode. On the other hand, the high-risk person is subjected to a more significant clinical evaluation in the doctor's office.

The process results in an estimate of what disease is likely to be present or occur. If it is present at the moment, then a treatment program is implemented. If a disease is not present, then we begin to implement risk reduction

programs associated with those risks. Those risk reduction programs might be directed toward changing environment, behavior, or implementing early detection programs for that employee such as periodic blood pressure screening, or drawings of blood to test cholesterol levels.

A key point here is that we are talking about *estimation*, not an exact science. It is the business of comparing one person's individual characteristics against a population's total characteristics to predict which individuals are likely to result in *future* claims, not because they previously utilized medicine or medical care services, but rather because of present health risks. We try to quantify the cost these risks pose for the HMO and allocate resources for prevention *before* significant claims are present.

For example, we can distribute the systolic blood pressure values of the population, then estimate the cost of the systolic blood pressure reduction program and the savings associated with those reductions. We might also look at a comparison of the ideal or attainable level of systolic blood pressure for a population versus the current values, and then estimate the associated cost. This can be done across a broad base of risk indicators: blood pressure, seat belt usage, cholesterol level, body weight, exercise, Type A behavior, smoking, and alcohol use. Some of these are positively correlated with future claims activity and future illness, while some of them may not necessarily be positively correlated. For example, Type A behavior may not, in the short run, result in a significant increase in claim costs. In some populations Type A behavior may actually result in a reduction in claim costs in the short run, because if you are a hyperactive executive trying to keep your business in order, you are less likely to seek out medical care until it is really needed. So basic levels of care and utilization may not happen, but catastrophic illness may occur.

Similar analyses can be established for heart attack risk. Heart attack risk is an area of importance for stop loss insurers, where risks to be concerned with are those that might result in catastrophic claims activity. Heart attack risk can be estimated to determine the current risk level and the effects of a variety of programs modifying that risk and moving it toward the ideal levels. For example, we could increase exercise programs, implement a program that

results in a lower cholesterol level or implement a different nutritional program, and then estimate what effect these programs will have on the risk level.

The key is to merge data. We are not trying to replace retrospective claims analysis. We are not recommending that risk estimation should replace any kind of historical, traditional and successful estimate of costs. Rather, we are introducing a new variable to execute a program whereby we can prevent claims from occurring, and measure where they have occurred to reduce the costs. The objective is to calculate that gap between attainable levels of risk and current levels to implement the *right* program at the right price to reduce risks and lower claims levels.

In one group with a sizeable employee population, current heart attack risk was estimated. The change in risk associated with the implementation of a simple, relatively low-cost educational program was calculated and compared to the relative rate of return on a more expensive program including blood pressure reduction, nutrition, and an aerobic exercise program within the company. Relative costs of these programs were determined and the projected medical costs estimated. With this application, decisions could be made to introduce the most effective risk intervention program to reduce claim costs. The early result was a return on investment of about 25-30%.

Risk estimation can be useful in financial consulting. The *total* cost of implementation of cost and risk containment efforts can be measured by calculating the cost of screening, estimating the number of potential high-risk employees and by calculating the cost of evaluation programs, follow-up programs, risk reduction programs and the support necessary. These costs can be compared to the estimated savings, and a relative rate of return on the net cost per employee can be determined. Usually, in year one there is no doubt that there is going to be an increased cost. If the employer is interested in pure cost containment on a one year basis, risk reduction programs will not be the answer. But, if an employer is looking over a longer period of time some remarkable savings can be generated in subsequent years.

The integrated health management system model can be the basis for HMOs to develop a program to estimate the top five risks within each HMO's enrolled population. Then it is possible to look at a variety of programs which physicians could implement to reduce risk for their patients, and to try to minimize the amount of associated claims. These cost savings should balance with the cost of implementation of health promotion programs across the rest of the population. One can target the most significant resources to achieve the greatest return on investment.

There are a number of potential applications in insurance programs. One application is based upon gathering risk data on an entire insured population, predicting the potential costs of those risks, and determining levels of discount which could be applied to "good risk" categories, either on an individual or group basis. The company can then segment its population or its marketing on the basis of risk scores. For example, assume there are three categories; a high-risk, a low-risk and an average-risk category. The low-risk group could be provided with an immediate discount, a rate guarantee, or alternative funding. High-risk groups would be offered benefits such as preventive care, intervention benefits and health promotion benefits. If implemented, those programs expect movement from the high-risk category to the average- or low-risk category, with the promise of future eligibility for discounts that would normally be associated with the low-risk group. The company uses the risk score to divide groups into pricing or marketing categories, and then markets services accordingly. High risk populations are expected to be more likely to purchase insurer programs aimed at risk reduction. Low-risk groups are going to be approached by competitors, and would be interested in immediate savings because of the low-risk status. The insurer can retain this profitable business by offering alternative funding.

Risk estimation can also be used by insurance companies to predict the probability of savings if alternative funding is chosen (if an employer group had an average risk score of X% better than selected peer groups). Depending on the predetermined low-average-high risk category breakpoints, we have found that, about 79% of the time, if you are 15% better than average you can win. That means, as an employer, if your group health risk estimate is 15% better than the norm, you are likely to achieve savings and therefore to be a viable

candidate for alternative funding. Furthermore, (again in this particular segmentation example) 71% of the time you can gain as much as 5%, 62% of the time you can gain as much as 10%, and so forth. This process can be implemented using a variety of breakpoints and target percentages. If the employer is only 10% better than the norm, that employer is still likely to win seven out of ten times on an alternative funding plan.

In another insurer application, we implemented a program where we segmented the population into high-risk and standard-risk groups. We then estimated the savings likely to result from the application of a simple risk estimation tool, versus the savings associated with implementing more comprehensive programs. For example, if your health risk profile says that your risk of heart attack is 15% greater than the norm for someone else with similar demographics, and your life expectancy is reduced by 11 years, you might do something about it regardless of whether your employer implements a program or not. So we measure the difference between what is likely to happen as a result of purely providing information to employees, versus offering health promotion programs to employees.

I would like to give you some specific estimates as a result of two programs that we have implemented: one with a major Fortune 100 company as a corporate case study, and one insurance case study. With the corporation, we implemented a program over a one-year period. We segmented the population into a control group where we did nothing; a group where we implemented only a risk estimation tool (the health hazard appraisal); and a group where we implemented the appraisal and subsequent follow-up programs. Then we compared the reduction in costs and risks associated with the difference between the appraisal only group and the program group, leaving the control group aside as a comparative measure.

There was a significant reduction in health care utilization, a reduction in average mortality risk over that one-year period, and a significant reduction in *modifiable* risk categories. There are certain risks that are not modifiable. For example, if you have a family health history of kidney disease or heart attack, there is nothing you can do to change that health history. There is nothing you are going to do to change your age or your sex. There are

also modifiable risks -- things that you *can* change. In this case study, there was about a 7% reduction in risk associated with modifiable categories, and a 25-35% reduction in heart attack risk depending upon the age group. Seat belt usage was up, smoking was down, blood pressure on the average dropped, and there was a major increase in exercise activities within the company. We compared the high-risk group at time one to the high-risk group at time two, to make sure that there was not just simple regression to the mean. This was not the case. In fact, the low-risk groups did not significantly change -- low-risk at time one was also low-risk at time two. But a high-risk group, when the program was implemented, experienced significant movement towards average-risk from one time period to another.

Many major companies are considering these types of programs. If it is true that benefits programs and employee benefits move as unions and large corporations move, then I think it is very likely that health promotion programs driven by risk estimation will be increasingly important. Contribution rates and pricing driven by risk estimates are very likely to occur in the next five or ten years because the small employers and insurers tend to move in the direction of unions and large employers.

As part of this total corporate study, attitudes of the employees who were involved were measured at the end of the year. We were interested in whether or not there were behavioral or lifestyle changes. This data is not useful pricing information, but it may be very useful from a marketing standpoint. The overwhelming belief was that the health risk estimation tool and intervention programs caused people to set goals which resulted in better health. 100% of the employees said they would recommend the program to fellow employees. The large majority said that the health risk estimation tool and the resulting programs provided new health information which influenced them. Over 90% of them said they believed the programs and data were accurate; 80% believed that the programs resulted in lifestyle changes and behavioral changes.

Insurance studies have also begun. In one study conducted over a one year period, we estimated risks on a population of about 7,000 people and compared claims activity to risk activity. Even after adjustment for such actuarial factors as age, sex, etc., we have verified a number of results. Some basic

information resulted, such as the fact that individual zip code, as opposed to employer zip code, was a better area rating factor, and that the deductible effect that Rand Corporation identified occurs.

In addition, if a preventive-care set of benefits was available within the insurance program, people would be likely to use it. The result, over time, would be an expected lower overall cost despite the initial increase in utilization as a result of the availability of preventive care.

Finally, positive correlations exist suggesting lower claims activity after risk measurement in the areas of smoking, seat belt usage and blood pressure levels. An interesting result of this study is the value of self-rating. Part of the risk estimation tool is to rate your own health status. We found a very positive correlation with future claims activity. If you believe yourself to be healthy, you are most likely to have less claims than if you do not believe yourself to be healthy. So, if we can encourage people to consider their own health and make efforts to become *more* healthy, they are likely to have fewer claims just as a result of that motivation.

MR. DAVID H. DUBOIS: How much improvement in claims activity is present after a year, and does this continue into the future?

MR. MCCARTHY: It is common that people experience an initial reduction in risk that is followed by a back-sliding. The back-sliding can be slowed by renewed effort on the part of the corporation to re-emphasize the program.

MR. LEONARD KOLOMS: You mentioned a number of health status factors. The only two that are not currently being used by companies which underwrite on an individual basis are seat belt use and exercise. To what extent are these correlated with morbidity costs?

MR. OGDEN: All of the health status characteristics I mentioned are factored in individual underwriting. However, there are currently no studies that *quantify* the proper morbidity differences.

MR. KOLOMS: Smoking is being used as a rating factor by our company. Do you see any problem, in the group market, of using a long questionnaire?

MR. OGDEN: The risk estimation technique obviously requires more administration. The administration could be just for rating purposes, or a total program such as Kevin described. Certainly a total program will require more administration.

MR. MCCARTHY: I would be careful about thinking of risk measurement only in terms of pricing. The real value of the information is in marketing. You can actually collect information about your marketplace that was not available in the past. In the group marketplace there would be tremendous resistance to using questionnaires for rating only. Employers would feel it was a throw-back to medical underwriting, and that is what they were trying to get away from when they went to group in the first place.

MR. KOLOMS: You mentioned working with the insurance companies in evaluating employer groups as to whether or not they should use alternate funding. What size groups were you working with?

MR. MCCARTHY: We are talking about groups of approximately 100-500 employees. This came about as a result of companies receiving pressure in the marketplace to provide alternative funding to groups of that size. We attempted to implement an alternative funding program that was tied to the risk estimates. We would collect risk data on the employees, and determine whether or not they were a good risk. If they were a good risk, they would be good candidates for alternative funding. But the company that is not a good risk would not save money or be offered alternative funding. Instead, a health promotion program would be installed that would result in a reduction in claims activity and risk, which then may qualify the employer in the future for alternative funding.

MR. JOHN M. BERTKO: You suggested employers could consider risk-based employee contributions. How would you present this to the employees and how would you help employers evaluate the risk along the way?

MR. OGDEN: Obviously, there is going to be some employee dissatisfaction. But if it is combined with a total program such as Kevin described, the employer can deal with employee dissatisfaction. The program would be presented to employees as part of a total package. An evaluation of the employees' lifestyles would indicate the areas of high cost to both employee and employer. The employer would like to make programs available that help the employee change his lifestyle.

MR. CHARLES J. SHERFEY: You have measured the lower health cost of a healthy lifestyle. Have you also measured the additional cost to defined benefit pension plans?

MR. MCCARTHY: Increased pension costs will result if you cause people to become healthier. The question really comes down to the employer's corporate philosophy. We deal with a lot of big companies. None of the companies have decided not to implement a health promotion program because it would cause greater pension costs.

MR. SHERFEY: Most employers like to have work-aholics. By instituting a healthy lifestyle program employers may end up with a very healthy population, but the company will be limiting the number of those employees working the extra hours.

MR. OGDEN: Certainly, that may be true in the short run. As long as employees are a work-aholics companies are getting great productivity out of them. However, if the stress leads to a serious illness, these employees come back to work at a considerably reduced productivity level, or are lost entirely.

MR. MCCARTHY: I believe you are talking about Type A behavior. I would be surprised if someone who was a Type A person, and stopped smoking or cut down on alcohol intake, would diminish his productivity.

MR. THEODORE W. GARRISON: Will statistical summaries of this Control Data research project be published or made available to the public?

MR. OGDEN: We expect to have the research paper available within two or three months. Future research will develop a rating structure by which to price health programs by health status. The rating structure would include costs by risk level, age, sex, type of service, claim size, etc. We will also study interrelationships between the seven major health characteristics.

MR. SCOTT C. THORNTON: Is there any standard methodology for classifying risks in the risk appraisal? Also, has there been any success with reviewing your past claims data by diagnosis, and using that information to classify people into high or low risk?

MR. OGDEN: The risk age that I mentioned was something that was intended to measure mortality. I do not anticipate it being used with medical cost data.

MR. MCCARTHY: There are a number of companies that do risk appraisal instruments which use different algorithms. The algorithms vary from one company to another.

MR. OGDEN: Your second question had to do with prior claim history. Our study, based on information from Control Data, is comparing prior claim history to health status indicators, and we assume that prior claim history will be a predictor of future claim activity if nothing else changes.

MR. MCCARTHY: The whole idea behind this integrated model is to use traditional prospective pricing techniques using retrospective data, and add additional information.

MS. JOAN P. OGDEN*: You have indicated that there is a possibility of using the health risk appraisal in terms of employer contribution or employee contribution. Do you have any estimates of the integrity of the answers if employee contributions for health insurance depended on their answers?

MR. OGDEN: Most of the questions in the health risk appraisal are verifiable through medical tests. In order to have a program work, and to be able to get

* Ms. Ogden, not a member of the Society, is a consulting actuary with Wilcox and Cannon.

active participation from employees, the program needs to start by helping people. In order to achieve the willing cooperation of employees, a program should be totally integrated. An appraisal would be made of employees' existing health status, suggestions made to improve on that status, and programs made available to save money for both employee and employer. Penalties would be built in long-term, but not short term.

MS. OGDEN: Is there any consideration of applying penalties only when participation in a behavior change program is not undertaken, rather than in the actual assessment of the health risk?

MR. OGDEN: If someone participates in a program that is supposed to improve his risk level, and it does not, he should not be penalized.

MR. MCCARTHY: We have seen it occur in one instance, in a Flex benefits program where the price tag associated with the individual benefit components was based upon the average risk, and the rest of the money was paid by the employees. Those people who were low-risk did not have to spend their money on health promotion programs. The people who were high-risk were more likely to spend money on health promotion programs. Successful completion of a program resulted in a reimbursement for the surcharge.