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Session 27PD
Lifestyles and Health Costs

Track: Health

Moderator: Geoffrey C. Sandler

Panelists: Thomas C. Kravis
Daniel R. Plante
Chris E. Stehno

Summary: Insurers and employers are increasingly looking at lifestyle issues and their effects on medical costs, both for managing costs and for making decisions about plan design. Panelists discuss the current trends in lifestyle issues such as obesity, smoking and the management/self-management of chronic diseases, and how they affect medical costs. Specifics include:

- *Metrics: How are they defined*
- *Impacts: Why/how do they drive up unit cost and utilization trend*
- *Solutions: Benefits design, Medical Management, Centers of Excellence and others*

At the conclusion, you understand:

- *how lifestyle "conditions" are measured and reported*
- *how to recognize impacts of adverse trends due to lifestyle issues*
- *available solutions to mitigate adverse trends*

GEOFFREY C. SANDLER: I'm Geoff Sandler, and I'll be the moderator for the session. We've seen increasing attention paid to lifestyle issues. Medicare has announced that it will cover some bariatric obesity treatments. Some employers are changing their hiring practices or their health coverages in some cases to penalize employees with lifestyle-related medical conditions. In our session today, we'll look at lifestyle issues and how they fit into the current view of health-care costs. We're

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Note: The chart(s) referred to in the text can be downloaded at:
http://handouts.soa.org/conted/cearchive/neworleans-june05/027_bk.pdf.

pleased to have three panelists who can lend their expertise to our understanding of lifestyle issues.

Tom Kravis is a physician with Reden & Anders in San Francisco. He has more than 30 years of experience in health care. He has extensive provider experience as CEO of a multispecialty physician practice management group. At Milliman, Anderson, Ingenix and now at Reden & Anders, he has provided consulting services to national, regional and local health plans, provider groups, pharma and government. He's currently involved in the development and implementation of severity-adjusted profiles and report developments for health plans, hospitals and physicians. Tom will give us a clinical perspective on obesity as an example of how lifestyle issues are currently being viewed, the types of analysis being done and available treatment.

Chris Stehno is a consultant with Milliman in Denver, where he leads the lifestyle-based profiling practice he started there. Chris will address how the growth in lifestyle-based diseases is dramatically reducing the accuracy in underwriting using traditional medical underwriting techniques. He will also talk about the emerging use of consumer data in predictive modeling to supplement traditional underwriting, producing superior results to traditional medical underwriting alone. Dan Plante is a consulting actuary with PricewaterhouseCoopers in Chicago. Dan will talk about ways that employers are responding to lifestyle issues.

DR. THOMAS C. KRAVIS: I had the pleasure of presenting in New York last spring, and after the session, one of the actuaries came up to me and said, "What is CABG?" I said it's a clinical term for coronary artery bypass graft, and she said, "Oh!" That didn't help me during the presentation because presumably a large percentage of the group did not know what CABG was, and Geoff was kind enough last night to give me some peer review of my slides. He suggested I start out with some sort of actuarial framework to the clinical presentation I'll be starting in just a moment.

To do that, I'd like to ask some rhetorical questions. For example, how many of you are from health plans or represent health plans where you know the waist measurement of the male beneficiaries? How many of you collect, report and analyze body mass index (BMI) on your members? How many of the actuaries here collect and analyze the ICD-9 code obesity and use that as a way of understanding how many of the members have the primary disease of obesity? The reason I bring these up is that those three issues, the waist measurement, the BMI and the ICD-9 code for obesity, are the measures that the clinicians working with actuaries have to measure this problem. As you'll see from the presentation, the tools are grossly inadequate. We'll be talking about lots of clinical things. We have pretty good evidence of what's going on clinically, but from the actuarial point of view, the tools you have to predict, identify and quantify what we're talking about today are limited.

What I'd like to do is briefly outline the problem here. Obesity is a driver of health-care costs. The tools that we have are limited. There may be undercoding by physicians because they're not reimbursed for obesity as a primary disease. The problem that we see today may be underestimated. There's no incentive for a physician to bill and collect for obesity because it's not considered a disease. There's an explosive growth in bariatric surgery and its complications, and this represents a significant driver of trends. The measures of effectiveness of programs are limited. I'll talk briefly about the assessment metrics, the classification of obesity and the risk factors and then talk about quality-of-life measures, hypertension, lipids and glucose. Then I'll go on to the evidence of the effective interventions to manage obesity at five years. You'll see the list is going to be small.

We're aware of the increasing problem of obesity during the past 20 years. Since 1960, we've gone from a little more than 10 percent of the population being obese to more than a third of the population today, and this is increasing at a tremendous rate. There was an article in today's *Wall Street Journal* that in France the obesity rate has increased. The French now are turning to the same sort of alternatives we have, such as working with three-star restaurants. The major three-star restaurateurs are now reducing the number of calories on their plates in their restaurants.

If we look back at the percentage of obesity between 1980 and 2000, each of these has increased during the past 20 years. About two-thirds of the population is obese or overweight. In the younger age group, under 20, the increase in obesity is the most dramatically increasing area of concern. Why is there so much obesity today? Geoff and others are going to allude to this in terms of lifestyle. We're talking about more than 50 years of dramatic lifestyle changes—of eating too much, exercising too little and consuming great quantities of highly refined, high-caloric food. About 40 percent of the American population have no regular physical activity. Only 15 percent walk 30 minutes five times a week. A third have no regular activity during their leisure time. There's a lack of organized resources and incentives to counterbalance these forces. For example, the IRS has looked at members deducting lifestyle modification services or programs and made them pretax deductible, and that initiative has never gotten off the ground as far as I understand.

Obesity is not considered a disease. If you go to major medical plans and to Centers for Medicare & Medicaid Services (CMS), other than some minor modifications, obesity is not classified and reimbursed as a disease. Finally, as I mentioned before, because obesity is not often reimbursed as a primary diagnosis, physicians will tend to undercode obesity. They will see patients with hypertension, and they'll bill that out and code that as hypertension rather than obesity. There are about 300,000 deaths annually, $100 billion in trust, almost 10 percent of annual health expenditures. Adolescents and African-Americans are hard hit. This morning I got up and jogged at 6 a.m., and I saw in my hour of jogging three other

joggers. I met eight or nine people on the sidewalk who kind of laughed at me like, what was I doing? Then I recalled that there's a ZIP code that we have in our database that is associated with hypertension, obesity and high cost, and it's this ZIP code. It's also high for renal failure and dialysis.

This lifestyle of the rich and famous is not jogging around at 6 a.m. in this ZIP code. There's no group that is left untouched by obesity, although the African-American population is touched more than others in certain geographical areas. The rich, the famous and the poor are affected. The common comorbidities of obesity are hypertension, heart disease, Type II diabetes and then this list of diseases that are associated with obesity in the literature.

This is an example of what we would look at as the episode-of-care cost. On this example we used the episode treatment group or software. We looked at the per-month per-member (PMPM) episode of cost in 2000, and we looked at the annual growth over the three years for several diseases. One was hypertension, where the PMPM was $2 or $3 with a 3 percent trend. Coronary artery disease was $5 with a 7 percent trend. Increased lipids had a 7 percent trend. Diabetes was $2.5 with a 15 percent trend. Diabetes Type I was $0.50 with a 14 percent trend. Our friend obesity is off the chart. The interesting thing is not these individual cost drivers themselves. It's the fact they're all linked to obesity. With every incremental increase in the prevalence of obesity, these drivers are also stimulated to drive further.

Obesity drives health-care costs. It's a vicious circle. It causes or aggravates Type II diabetes. It causes cardiovascular disease. This leads to increased costs. The costs increase when the BMI, which we'll talk about later, is greater than 27. There's a good correlation between a BMI over 30 and the particular value and future cost. Obesity correlates also with cardiac disease. And, as Geoff mentioned with the employers, there's a good correlation between obesity and sick leave and the cost of that member not only leaving and going to a doctor, but the lost work time and the substitution cost of that member leaving work because of obesity-related problems. The disability costs are about two times the cost. CIGNA did a great job a few years ago of looking at obesity cost and its contribution to workplace-related illnesses and injuries and the total cost to the employer between the work-related injuries and the medical health care-related cost of care.

This is an area where we do have data. Unlike the BMI and the waist—the belt size—we do have information on total PMPM costs for low-LDL cholesterol, which is linked to obesity in many patients. This is the reference group where about half of the patients had less than 100. A third had 100 to 130, and these are the costs. And this is the LDL greater than 130. There is a marked increase of costs that are strictly based on the LDL, and although there are some tables on BMI for this type of cost projection, those types of tables are limited.

How do we assess overweight and obesity? There are the different ways besides looking at a patient. We think of stroke as being the silent killer because I could be up here with a blood pressure of 220 over 120, and I wouldn't know it, and you wouldn't know it. That's why it's called the silent killer. This is not a silent killer. We can see the problem. We don't have to have sophisticated measures to understand the problem is there. What we're lacking are measures to quantify it and project its effect on future costs. The BMI is a calculation either in kilograms or pounds. The weight circumference is a simple measurement of weight. The BMI metric is simple. It's rapid and inexpensive. It approximates total body fat that it can use to monitor the effectiveness of any intervention program. It correlates well with morbidity, cardiovascular disease and risk factors. However, the linkage to mortality is not as strong, and it does not factor in cigarette smoking. most of the BMI and weight-loss studies have not looked into whether the patient smoked. They did not look at diseases like cancer that would have caused weight loss in those patients. It's imprecise in its measure of the biologic effects of obesity, such as hypertension and hyperglycemia.

This is the World Health Organization of weight and risk for comorbid conditions. There's the underweight, normal and overweight, and I'm going to concentrate on the obese. We can divide the obese patient into three types based on the body mass index up to 34; greater than 35 and greater than 40; Type I, II and III. You can see that if you also look at the normal waist circumference and the risk for diabetes, hypertension and cardiovascular disease, with a normal waist circumference as opposed to an increased waist circumference, the risk of these associated diseases increases. There are other risk factors that the other speakers may speak to that may respond to lifestyle alteration. These are hypertension, LDL, HDL, triglycerides, blood pressure, family history of premature heart disease, sedentary lifestyle and cigarette smoking.

This is from the National Heart Institute, and it's the institute's evidence model to measure the impact of treatment programs on weight, abdominal fat, fitness and risk. Much of the evidence that has been amassed by the national bodies is based on models that are similar or the same as this. What the model looks at is an overweight individual. It assesses that member or that patient with certain tools that measure the calories in and the calories out, meaning what is the net calorie expenditure of that individual? Then they compare that baseline with various treatments. They measure, as a result of those interventions and treatments, abdominal fat, the patient's weight and fitness, and, in some instances, cardiovascular fitness. They also would measure the effects of the treatment interventions on high blood pressure, lipids and glucose tolerance. This is the part of the model that you, as actuaries, are probably most familiar with. That is, the actual incidence and prevalence of cardiovascular disease, cardiovascular mortality and morbidity, and the noncardiovascular mortality and morbidity. All of these things are linked, and the point I tried to make earlier is that the tools that we have, particularly at this point, are crude and certainly not incorporated into the model of most health-plan actuarial databases.

I'd like to look at the different levels of evidence, and we'll talk about what works in obesity and what doesn't. There's been a great deal of examination of these different treatments and a grading of the evidence. A means that there's strong evidence that it works. B means it somewhat works. C is not so good. D works even less. The point of this is that there's little good evidence, Type A, that the interventions we're going to talk about today give sustained, significant weight loss and improvement of comorbidity conditions at five years. That's a pretty high bar, but that's the bar that the major health plans want us to look at. If you look at the interventions, the findings, good programs to significantly reduce weight are limited. The measures of effectiveness of weight-loss programs have lots of gaps. There are no universal assessment criteria for trials. If you read the literature, everyone's using different criteria for measuring outcomes.

Weight loss can be reported as a percentage of pre-op weight or excess weight. One study showed that if you used one of these definitions, 90 percent of the people in the study still had the same weight that they had when they started. That's just by changing the definition of the term. Data collection of follow-up is inadequate. There are limited actuarial data, particularly for the obese and very obese patient over 45 kilograms, over 45. Severity-adjusted data are limited. As for randomized control studies comparing surgical with nonsurgical obesity greater than five years, I haven't been able to find them yet. If you have some, please share them with me. The operative techniques that are being studied over the years have been changing. So now we have multiple studies on surgical intervention with different types of procedures. Finally, there's the barrel system. This is a point scale to evaluate weight loss. It looks to comorbid conditions, complications and five elements of quality of life. It is something that could be considered as one of the metrics in assessing, quantifying and following weight loss.

Quality of life in obese patients has been shown to improve with programs. This is important because we recently did an evaluation of chiropractors and found that their patients are the happiest patients around. Some of the reasons they're happy are they self-refer, they're not sick when they see the chiropractor and the chiropractor touches them. So they feel real well, the outcomes look good, and the cost is low. The point is that quality of life is something patients measure. The quality of life increases in this particular study with weight loss. The greater the weight loss, the greater the improvement in quality of life. If you don't save them or don't reduce their mortality, they're going to feel better right before they die.

As for hypertension in obese patients, lifestyle trials in overweight patients achieve weight loss from 3 percent to 9 percent. There's strong evidence of that, but, as you'll see, some of those changes cannot be sustained and/or are significant at five years. What about lipids in obese patients? Lifestyle modification reduces serum triglycerides, increases HDL cholesterol and reduces total ADL. There is strong evidence that this is the case. As a clinician, if your health plan were doing this, we would support it. Regarding glucose in obese patients, lifestyle modification reduces glucose levels in overweight and obese patients without diabetes, and weight loss

reduces blood glucose levels and hemoglobin A1C in some Type II diabetics. This is compelling evidence. The important thing here is the A1C level is a good predictor of future diseases, comorbid conditions and associated costs. The fact that lifestyle modification can reduce hemoglobin A1C is good, compelling evidence that lifestyle is something that you should probably be supportive of.

Here's an example of lifestyle modification in the *New England Journal of Medicine*, 2001. Obese patients have an abnormal rise in blood sugar after they eat, and this abnormal glucose tolerance test is considered a precursor of diabetes. If people have this abnormal response to food and eating, they develop diabetes. This Finnish study looked at 522 middle-aged, obese patients with impaired glucose tolerance, intervened with brief counseling and lifestyle modification, and at almost five years, I believe, now there's about a 60 percent relative reduction in the instance of diabetes. This is good, compelling, Type-A evidence that lifestyle works.

What is the evidence then that the following programs are effective at five years? With dietary therapy, the key is that most regain weight over the next five years. There's lots of evidence of that. There's a high dropout rate, and the weight loss rarely exceeds 10 percent of initial body weight. Time will tell whether there are significant long-range changes.

The combination of a reduced-calorie diet and increased physical activity produces greater weight loss than diet or physical activity alone. You would think that would not require all those studies, but that's the evidence. It's indisputable. Physical activity as a part of a comprehensive program contributes to weight loss in overweight, obese adults.

With behavioral-management therapy habitual eating and physical activity behaviors are relearned to promote long-term weight change. This is important when we get to the bariatric patient. Lots of bariatric surgery patients go back, and they remember how they used to eat. They take their tiny, little stomach that's been squished down to the size of my hand here, and they tend to expand it by eating more, and they throw up every now and then and feel sick, but I guess it's worth it. Relearning these behaviors is difficult because sometimes they're ingrained. A lot of people think there's a genetic component of this that you can't change at this time. Again, combined lifestyle interventions, increased physical activity and behavior therapy provide the most successful therapy for weight loss and weight management. If you combine all these interventions, it's the multidiscipline, multiphase approach that works.

How about drugs? There are some safe drugs and there are some not-so-safe drugs. You remember Fen-Phen. When I was at Milliman we did an analysis of what the costs were going to be to the company, and the company said it was about $2 billion. As of two weeks ago it was more than $20 billion in damages due to Fen-Phen lawsuits. When we talk about these drugs, there are some studies that show there's some effectiveness at two or three years. Be careful of what happens at five

and 10 years because we don't know what the bad side effects of these drugs are going to be. There are two drugs, one of which has had promising results in Europe. They are going to have a good, aggressive marketing program to clinicians and perhaps patients. You ought to get your slide rules out and start projecting what it's going to cost your health plan when doctors start seeing patients and start dispensing that drug and bring them back again to see how they're doing.

Bariatric surgery in experienced centers may result in weight loss for carefully selected patients with clinically severe obesity—a BMI over 35—when less invasive methods of weight loss have failed and the patient is at high risk for obesity-associated morbidity and mortality. Each of the parts of that paragraph is important. There are patients who are out there cheating. They are cheating so they can have bypass surgery. They are lying to their doctors. Some doctors encourage their patients to lie. I can't imagine that as an incentive. But they are trying to meet the criteria so that their health plans, if they have it as a benefit, will let them have bariatric surgery. Or they're eating and gaining weight so they can get up to the threshold so they can get their bariatric surgery.

Bariatric bypass's mortality rate is 1 percent to 5 percent, and complication costs are high. We did an analysis on a large health plan for an insured group in an ASO client and looked at this, and there are two things that came out. First, if you don't have it as a benefit, patients are going to get the surgery anyway. How do they do that? They go to these other doctors who code differently for the procedure. In one particular state there are a lot of claims where doctors have done bypass surgery and coded it as something different. Second, the complication cost is high. If you look at a bad complication rate, even if it's 1 percent or 2 percent, that 1 percent or 2 percent may cost $200,000, $300,00 or $400,000 a clip. We looked at 1,200 bariatric surgeries before, during and after the surgery and then looked at the complication rate. If there were any savings due to the surgery, they were completely removed due to the cost of complication, not counting the deaths. The complication rate is low, but in the wrong hands and the wrong centers, the costs are high.

This is the only study I found in the last year that looked at the cost-effectiveness of gastric bypass from the health plan's point of view. The conclusion here is important because reduction in lifetime medical costs was not greater than the cost of treatment in any subgroup. Gastric bypass surgery was not cost savings from the payer perspective. You have better years that don't cost that much, but from a payer's point of view, it did not appear that bypass was cost-effective.

What can an actuary do? There's a lack of universally accepted study criteria and outcomes metrics and limited numbers of random control trials with long-term follow-up and data collection. This limits the ability to clearly identify and compare the relative value and effectiveness of individual and combined weight-loss programs at five years. It's a pretty safe statement. Combined lifestyle modification in severely obese adults can achieve weight loss and a reduction in comorbid

conditions in some patients but does not commonly achieve sustained, significant, long-term weight loss. A majority of patients regain weight over the following five years.

Pharma therapy, after five years, is not established therapy. There's evidence that workplace management provides reproducible, sustained, long-term benefits and a reduction in comorbidities. Bariatric surgery for selected patients performed at experienced centers and with appropriate follow-up care have achieved weight-loss improvement of some comorbidities and quality of life at five years, but the cost of complications is high, and there was no substantial evidence of cost savings from the payer perspective. Finally, bariatric surgical technology has improved, and there are now aggressive marketing efforts to stimulate new consumer demand. So if you see blips in your trend under endocrine, drill down to bariatric surgery, and that's the local hospital marketing its bariatric surgeon.

How can you impact this issue? These are my own ideas. Reden & Anders is not responsible. These are my personal opinions, so don't call up corporate and tell them this is what we think. This is what I have to say. I think we ought to support the classification of obesity as a disease. I think it ought to be coded out as a disease, ought to be considered a disease and should be treated as a disease. We should support the development of evidence-based weight-management programs. Diabetes 15 years ago would not reimburse the physician for educating a diabetic about how to get insulin. They've changed that, and you saw nurses and doctors being reimbursed for education of diabetics, and it seemed to have some positive effect. I don't know why we don't do this with obese patients. Only 27 percent to 47 percent of all patients who are overweight are ever told by their doctors to lose weight. Why? There's little or no incentive.

Select appropriate metrics to identify, quantify and track interventions. Give a belt to every one of your members so they can measure their waist size. I'm just kidding. Measure the BMI. I know Kaiser encourages its members and staff to calculate, record and track BMI. BMI should be a vital sign. It should be like your blood pressure. Reimburse physicians for teaching weight management. There should be weight-management programs, and there's reimbursement for it. It's as simple as that. For evidence-based weight-management programs, and we've already gotten to all the evidence, there are some that have evidence that they are effective. Reevaluate benefits for bypass surgery and related procedures. If you are a health-plan actuary and include bariatric surgery as a benefit, you should look at that closely. If you don't have it, you should then make sure you're out there looking for fraudulent and abusive behavior of patients and doctors who are doing those surgeries even though they do not meet criteria.

And, importantly, identify complications of surgery early and provide medical director guidance. As soon as you hear of a patient in a hospital who's got a big bill, is on the ICU, is trached and is on a respirator, find out who that doctor is and start fixing the problem. It's going to cost you if you don't turn that spigot off. The goal

of that is to develop a centers of excellence program for surgical intervention. There are good centers. There's one in San Diego where the cost is $15,000, hospital and doctor combined. There are other good, low-cost centers with low mortality rates and low complications, and then there are all these others. Find a good one, and if patients are going to go to a place, tell them where they ought to go and where the best place to have the surgery is because they're going to get there. They're going to either eat themselves there, or they're going to cheat themselves there.

Utilize models to project anticipated increases in PMPM cost because of obesity. I don't know how you're going to do this. We use the Episode Treatment Groups (ETGs). Some think that's the tool that has some weaknesses. I acknowledge that, but those slides in the beginning showed the episode of cost by obesity where we identified obesity as sort of the target disease we wanted, and then we looked at all the costs associated with obesity. A tool like that would be helpful in understanding your current costs and then projecting future costs. And then start pricing now for these two new drugs (Rimonabant and Zonisamide). I'm not a stock player or a gambler, but I think this is going to be a good one. They call it a billion-dollar stock in the securities' and analysts' circles, and I wouldn't doubt that.

MR. CHRIS E. STEHNO: I'm going to go through some quick facts. About 70 percent of the diseases and subsequent deaths are lifestyle-based. Lifestyle-based chronic disease counts for about 75 percent of the nation's health-care cost now. One in three Americans who were born in the year 2000 will develop diabetes in their lifetime. In fact, if we break it down by ethnicity, about 30 percent of Caucasians, 40 percent of African-Americans and 50 percent of Hispanic U.S. citizens born in the year 2000 will develop diabetes. These are some staggering facts.

I'm going to talk about the practical applications that are out there now. We can help measure these risks, which you can use as actuaries, underwriters, etc., to help price in the future and get control of some of these things that are happening. You've probably all seen the green line before (see Stehno page 3, slide 2). It's from Kaiser Foundation for the trending of health-care premiums. You'll see that the majority of all the increases are coming off of lifestyle-based diseases.

What is this doing to you as actuaries. underwriters or health-plan administrators? The old techniques that we have had in the past as underwriters to underwrite these risks are becoming less effective. Whether it's medical claims record experience, BMI, fluid testing, etc., they're not good at determining risks associated with lifestyle-based diseases. New methods that are coming out for claims analysis, risk adjustment, etc., are helping but are still not doing a good job of solving the problem. Lifestyle-based analytics is what I'm going to talk about today. It's a new technique out there that's using old actuarial assumptions or principles, or predictive modeling, or whatever was done years ago to come up with the original tables. But now it's using a different dataset, and that dataset that we're using now—we'll start to talk about it in a little bit —is consumer datasets, so it's the Big

Brother thing that everyone is always talking about. We're going to go over lifestyle diseases, talk a little bit about the data, look at an example, and then discuss how we're currently using it in the health-care industry.

These lifestyle-based diseases are the ones that we have found good, positive correlations to in tying them to consumer-based datasets, but there are a few down here (diabetes, hypertension, cardiovascular, stroke, COPD, cirrhosis, most cancers, some mental health such as depression and Alzheimer's disease, osteoporosis, arthritis, back pain, and maternity. Maternity's not necessarily a lifestyle-based disease, but a lifestyle-based condition. I'm not an actuary. I don't necessarily claim to even pretend to be one, but from what I know on actuarial tables when you're doing age/sex, when you're doing maternity, it's usually an age/sex and possibly a family status type of calculation. In consumer datasets, now we know the ages of your children and how far apart they are. We know what size house you live in and how many bedrooms it has. We know your financial situation. We know what type of vehicle you drive. We know all sorts of other factors now that can easily produce your results considerably better in determining the chance of there being a pregnancy in the next year or two years out.

This chart is by the American Cancer Society. I also heard that actuaries like charts, so I put a couple in here. This is a correlation between different types of things that cause cancer. I came up with diet, 35 percent; smoking, 30 percent; and sexual behavior, 7 percent. Overall, 82 percent of the factors listed for cancer were lifestyle-based. There are only 18 percent that had to do with hereditary, genetics and some other reasons. You can see the strong correlations that are happening around us when it comes to lifestyle-based behavior.

Now for a little bit of consumer data. People always want to know what Big Brother's talking about or what they know about us. I'll get a little bit into that. The biggest fact that probably shows you how much consumer data is out there is the industry-recognized measurement or estimate of how much data is stored on individuals. It's called DSPS, and it's disk storage space per person that's purchased each year. This is on top of all the other disk storage space that they have. The main function of purchasing that disk storage space is to track information on individuals. In 1985 it was 0.02 megabytes. In 1995 it was 26. In 2005 it's anticipated to be 3,500 megabytes per person in the United States. So there's a huge amount of data that's being tracked on individuals in the United States.

Whom do we have data on? We have it on about 95 percent of the U.S. population. There are significant amounts of data on 95 percent of the population. In the past, these data were always measured as household data. What is your household doing? Marketing is getting more and more explicit, and they want to market to an individual and not a household, so they've now created great algorithms that are starting to split out these data into individuals within the household. What do we have data on? We have demographics, age, sex, race, etc., financial information, what you would expect, through credit, industry, banking, etc., household

information, marriage, number of kids, etc. The combination of financial and household are good, strong indicators of stress. Stress leads to obesity and a variety of other mental disorders. We use these data for these types of models. We have a lot of lifestyle-based elements. We know how physically active you are. Do you run? Do you walk? Do you play golf? Tennis? We also have classifications we call physical inactiveness. Do you sew? Do you knit? Are you a coin collector? What types of things would take you away from being physically active? There are estimates on computer time, on television time. All of these things are being tracked on individuals.

We know food purchases, fast food, diet food. Are you into diet food? Do you purchase diet-types of things at the grocery stores? We know a little bit about wine and alcohol consumption. We know about self-improvement. What types of books or magazines are you ordering or do you subscribe to? Also there is a variety of other self-identification things. We know about tobacco use. We know about your occupation, which leads to stress. We know about travel, motor vehicle, recreational vehicles, etc. Where are we getting all these data? We do get some of it from the U.S. Census. That's usually more on a block level. We don't use so much of that. Government and public records are other sources. We know birth certificates. We know the types of cars you register and other types of things like that. Financial information is probably our biggest source. Every time you use your credit card, every time you use your debit card, all that's being tracked, and I'll talk to you in a couple seconds on what we can use and what we can't use with that.

What about surveys? Most people say they never fill out a survey. But if you go to Circuit City or one of these places and purchase a television nowadays, instead of filling out the little warranty card, they usually do it for you right there in the store, and they'll ask you a couple of questions. That's survey information. Even knowing that you have that television or how many you have is also considered a type of information. There are warranties, like I mentioned, and loyalty programs. This is Sam's Club. This is your grocery store now, Safeway or Kroger. All those data are being collected on individuals, as are Internet purchases, subscriptions to different magazines and a slew of pieces of information.

Why do we have these data? Historically it's been used for marketing purposes. All of the credit card offers you get in the mail, all of the mortgage offers and Lands' End catalogs, all of the others use this to identify you as a good target, a good candidate. What we can use is defined by Gramm-Leach-Bliley, which I think most people here probably knew was the act that repealed Glass Steagall. Everyone thought the financial services industry was going to consolidate, but another part of that talked about privacy of financial information, and what is said is that I cannot see every single transaction that you make on your credit card. I don't know each individual place it went to, but they will allow you to consolidate that, to roll it up into categories, and those categories then sell to different types of companies that want to purchase it to market to you in particular. For example, give an example of what an avid runner is. An avid runner is someone who goes to Dick's Sporting

Goods, purchases running shoes, uses a credit card to sign up for a race and also probably subscribes to *Runner's World* magazine. If you fit that characteristic, they'd describe you as an avid runner, and those are data that they can sell to me.

I'll use myself as this example. I'm a 40-year-old male. I drive a minivan. In one case, I have two children. In one case, I have zero children. In the case where I have zero children, I'm 10 times more likely to be diabetic, the reason being minivans are designed by the industry for pretty much one of two reasons. One is you're toting your kids around. The other reason is they're easy to get in and out of, you don't have to bend down, and you don't have to necessarily jump up to get in them. The seats have the big things on the side that you can move up so if you're obese, you fit in the seat. There's lots of room between the seat and steering wheel. The vans were designed for these purposes. When you're driving home next time and see a 40-year-old male driving a minivan, and there are no kids in the back, take note and watch some of these things.

As we go down the list, you'll see a few other things that we'll put in a model, and a typical profiling model will end up having about 20 to 25 variables. In this one, we look at outdoor recreation. One person has four categories. The other one has zero. Education plays into it, as do lifestyle indicators and hobbies. By the end we were able to say by comparing Employee A, who is a healthy person, to Employee B, there's over 100 times differential on whether that person is diabetic.

Where are we starting to use this? Where we're seeing it or just starting to see it pop up now is in underwriting, disease management and wellness. Traditional underwriting, as I had mentioned before, focuses on past medical history. The problem with that and lifestyle-based diseases are that lifestyle-based diseases do not in general have good medical precursors. There are not a lot of things that are going to tell me all of the sudden you're going to be a diabetic or that you're going to have a cardiovascular event when you look at medical history. What we need to do is look outside the box, and that's where we came up with this. What other datasets do we have available to us to help us make these predictions? What we found are high correlations between lifestyle-based data and the propensity to have one of these diseases either now or in the near future. This is pretty much limited to lifestyle-based diseases because that's what the data we have correlates to. Using an example I mentioned about maternity a little bit ago, even if you just do a simple Bastian model off the ages of the children who are currently in the family and how many there are, that's going to give you heads and tails above what's currently being done to estimate maternity cost. I'm a good example of that as well. I just moved to a new house with four bedrooms. We have two children. Everything was perfect. We have an extra bedroom for when the grandparents come over. The next thing you know we're having another kid in December, but I will guarantee you now that that will not happen again. I'm going to take the steps necessary to do that. Different facts like that, such as the size of the household,

can give you a lot better understanding of where these costs are going to come from.

This is a little example that I put in here because you are actuaries and like to see tables. This is called a Lorenz curve (see Stehno page 13, slide 1). Do you remember that from statistics? What it is is a post-review analysis. If we predicted everything up front, let's wait a year and see where the actual claims costs came in. I'm showing you the top half of it. I guess that's the sensitivity half. The bottom half would be specificity, and I don't have that on here just due to time. What the blue line is more or less 50/50. If I have 100 people in a room and move 20 to one side of the room randomly, those people are going to have 20 percent of the claims. If you medically underwrite people, and that's this purple or pink line, and say, "I'm going to take 20 percent of the people now who I think are going to have the highest-cost claims and move them over to this side of the room," and then at the end of the year you saw where they came out, they came out probably at about 35 percent or 40 percent of the claims. That's through medically underwritten claims. This was on an individual plan. They had a long form, and I think they used Medical Information Bureau (MIB) as well.

This is using absolutely no medical data whatsoever. I'm just using lifestyle-based data. We take our 20 people who we think are going to be the highest-cost claimants and move them over to that side of the room, and we're almost exactly in the same place. I'm not necessarily trying to sell this as a replacement to underwriting. Where the big bonus to this comes in is that medically underwritten finds those people who currently have something or something that's maybe hereditary or genetic-based that they can make a predictor off of. t excels in those areas. It does not excel in the area of lifestyle-based diseases. Lifestyle-based analytics, on the other hand, excels in the area of lifestyle-based diseases. If you do a combination of these two, you wouldn't double it because there is a little bit of redundancy between the two, but you would definitely increase that curved line somewhere up in here, in this range.

Here's another example looking at long-term-care insurance (see Stehno page 13, slide 2). One of the other attributes or features of this is that it's a better predictor of forward or future claims costs. A lot of times when I talk to the health-care industry, everyone's interested in what's going to happen over the next 12 months. Yes, we can help with that, but where we even have a little bit more power is if we're looking out a couple of years. With any type of product that has a little bit longer duration, you're going to see a little bit better results with lifestyle-based analytics.

Applications include small group health underwriting, which is using it to augment current techniques, especially in those states where you have limited bans on how much you can raise your rates each year. We're finding that this is powerful in helping predict the initial cost up front because if you don't, there's no way you're ever going to get rid of that group. It's going to be stuck with you forever. The

medium-group marketplace is probably where there's the most attraction for this right now, where there's an absence of data. You're not getting good data in. You're getting a total claims cost over a couple of years. You may get census on the group of people. This can come in and do a good job or a heck of a lot better job writing that group of people. I should mention in order to do this, the only thing we need is your name and address, even if the address is historical. We can't use Social Security numbers, and we can't use some other things because they're protected by Gramm-Leach-Bliley. If you give me a group of 100 people, I'm probably going to match at least 92 of them based on name and address, even if the addresses are a couple years old.

In those cases, people are scared of using it to write someone or increase their rates, especially on the life side of the equation. What we're doing there is looking as a predictor the healthiest people. There are all these preferred, preferred plus, etc., categories, and most all of those are clean aps. So how do we differentiate them? This is a good way to do that. Let's discuss teleunderwriting. Before people make calls, if they have something in front of them that says this person's at high risk for diabetes or cardiovascular, something like that, it gives them a chance to start their questioning at the appropriate place or even determine who they should be making the phone call to. We're seeing some use it as fraud detection as well.

There's a place where I hope this goes in the future, but right now determining who's going to pick up the bill is the question in disease management and wellness. Current disease-management techniques are a problem with predictive models now. It takes five or six correlated medical experiences or medical occurrences before a good predictive model can pick up and say that there's a problem. We need to get someone involved. By that point in time some people have the disease. The disease is no longer an early onset. They're no longer in the predisease state. They have the disease. At that point in time, looking at the lifetime cost of the disease, they haven't met all of that yet. But if you do put in things, and you can reverse it, the best you can make up is about 20 percent of the total cost of that disease over the lifetime. When you consider the cost of those programs, that's why we don't see a lot in disease management right now because that's eating up that extra 20 percent savings. It's hard to prove an ROI right now.

Where we're moving with lifestyle-based analytics is in combination with medical data. Now we can predict this disease a lot earlier. We can predict it somewhere between maybe one and two or two and three medical occurrences. At that point in time, if you can get in there and get the interventions and get everything done, you're probably in the early onset of the disease, predisease stages, and you have a better chance of making some positive outcomes out of the disease management. Wellness is similar. We don't necessarily need any medical data. These lifestyle-based data that we have on you are almost like following you around for a week. If you follow someone for a week, you can estimate or guess what's going to be wrong with the person or what diseases they have. That's where we're using this to

locate the people who are highest at risk for diabetes or COPD so we can get them the help they need up front before this turns into anything.

In conclusion, the real value that we see in these lifestyle-based data isn't necessarily on the marketing side where it has been for years. But we see that its true value is as an excellent predictor of health risk, in particular health risks that are tied to lifestyle-based diseases, which are getting to be a bigger and bigger problem in our society today. I'm going to be offering a couple of Webinars. If you're interested, I'll go into a little more detail. Just send an e-mail to chris.stehno@Milliman.com.

MR. DANIEL R. PLANTE: Let me give you just a little bit more so you can understand the basis upon which I'm delivering my presentation. I'm a consulting actuary in health care and have been pretty much devoted to the consumer-directed side for the past six years. There's a lot of debate about whether consumer-directed works or doesn't work. It depends on the industry you're talking to. It depends on the consultant you're talking to. I'm not going to debate that. But one thing that's come out of the consumer-directed movement that I think has shown a lot of promise has to do with health-risk assessments where the individual on his own terms, with the help of the employer, gets a better sense of where his lifestyle is taking him. This has been such a successful endeavor thus far that we're finding a lot of employers are saying, "Let's put this in place outside of our consumer-directed plans so everybody can take advantage of that." That's where we're seeing employers move these days.

Individuals can maintain low-risk health status even as they age. It is the golden ring. That's what we want as employers: to keep our employees in a low-risk category, and we'll talk a little bit more about how you define low-risk categories in a little bit. Health plans of employers can help members to do this. It is a joint effort. If you think of it as the individual's effort, how many of you are members of a health club and don't go often? I don't do it on my own. If my employer said, "Dan, I'm going to pay for your health club," what makes it think when it pays for it I'm going to go any more often than when I pay for it and don't use it? It's more than some simple endeavor such as that. The major economic benefit is in paying attention to the individuals at the low-cost, low-risk health status. Once you get people in that category, you want to keep them there. You do not want to spend a lot of money providing interventions to people who are already in the low-risk category.

You want to put your money in properly directed avenues, but once you get someone in the low-risk status, help him maintain that. It's a corporate strategy. This is on all CEOs' hit list of things that they need to worry about. Ten years ago in the consulting industry, health-care actuaries did not talk to presidents of companies. We did not talk to CEOs. We did not talk to CFOs. We talked to HR directors. Now we almost always are meeting with the CFO. This has become a key issue. That's good news. It's bad news because health care has become such a hot-

cost ticket, but it's good news because employers are focusing a bit of effort on addressing this. It's driven from the top down. Employee participation is critical for this to work, and we'll talk a little bit more about how you can make this participation a little bit more successful with employees.

Resources are available. Most insurance companies, if not all, have some sort of tools that allow the individual to monitor and assess his own lifestyle and risk. I think we're going to see the growth of that. Now, ultimately, what do we want to shoot for? Studies have shown that the best that you can achieve on a long-term basis is 70 percent of your population in a low-risk category. It has been difficult, if not impossible, to achieve more than that over the long term, and it does not matter which industry you're talking about. Seventy percent is a consistent measure.

Let's play a little game at home here. You can all play along with me if you want. I've got a sample health-risk questionnaire here, and I'm going to use as a guinea pig, my favorite subject, me, as we go through this. I love my job most of the time. Let me give you the first four questions of this. I take good safety precautions such as using a seatbelt in a moving vehicle. I'm within five pounds of my ideal weight. I know three methods to reduce stress that do not include the use of drugs or alcohol. How do I fare thus far? I love my job most of the time. Well, in fact, the study that the speaker at lunch talked about is true. I do love my job most of the time. That parole officer thing sounded interesting, but I'm going to stick with what I do now.

I take good safety precautions such as using a seat belt. I don't even get in my car to get something out of the glove compartment with putting on my seatbelt. This has become such an ingrained activity for me. So, yes, I am within five pounds of my ideal weight. I thank the SOA for giving me this podium so you don't all see that I'm not within five pounds of my ideal weight, and I'm finding as I get older, and my height is decreasing now, no longer is my weight a lie on my driver's license. My height is a lie on my driver's license as well. I know three methods to reduce stress that do not include the use of drugs and alcohol. I do. I'm not going to get into what they are, but I do. Thus far, I'm faring pretty well on this health-risk questionnaire.

Next on the questionnaire: I do not smoke. I sleep six to eight hours each night and wake up refreshed. I engage in regular physical activity at least three times per week. I have seven or fewer alcoholic drinks per week. I don't smoke. I don't get six to eight hours of sleep a night. Like Chris, I have two small children at home. I don't need to say any more about why I don't get six to eight hours of sleep a night. I engage in regular physical activity. This is a sticky one because each individual will define what they consider to be regular physical activity in different ways. I think most of us will define it in such a way that we would say, "I get the regular physical activity." The truth is I do not. I think you want to have sustained physical exertion for 20 to 30 minutes.

One of the interesting things on the luncheon speaker's survey or criteria for a good career is physical exertion. It seems to play up that as a profession, we don't have a lot of physical exertion. I don't know that that's a good thing for us. Seven or fewer alcoholic drinks per week. I have, yes, seven or fewer a week. I'm now up to three "No's" on my questionnaire. We'll come back to how that fares, but I'm not looking like a good a candidate for a low-risk health style, or lifestyle, as we started.

I know my blood pressure and cholesterol. I follow sensible eating habits. I have a good social support system. I maintain a positive mental attitude.

In fact, I do know my blood pressure and cholesterol, and even though I'm not within five pounds of my ideal weight, I am in good shape on those. I follow essential eating habits. We'll just move on past that. I have a good social support system. Yes, I do. I mentioned two kids. That's a good social support system. I maintain a positive mental attitude. I love my job. I love my family. Where do I stand? I have four "No's." A third of the questions I did not feel I stacked up appropriately. I hope that some of you were playing along and kept track of your own personal scores because we want to come back to what that number means.

There is a good study done by the University of Michigan that identified a number of health-risk measures (see Plante slide 6). These often tie fairly closely to the health-risk questionnaires such as the one that we just took, and they identified high-risk criteria. I think we have 14 criteria here. In my case, I have three that would be classified as high-risk criteria. I'm not going to get into them because this is being recorded. But overall risk scores are if you have zero, one or two of these, you are considered a low-risk person. If you have three or four, you're a medium-risk person. If you have five or more, you need a lot of help. I'm in the medium category. That's important to understand because that starts to give me a sense, and ultimately PricewaterhouseCoopers a sense, on how much it can save if I start to embrace a healthier lifestyle. Keep that in mind because we want to come back to low, medium and high and what that generates.

Regarding excess medical costs, we'll use as our baseline people who are low risk. They have zero, one or two risks. These are 2001 data. The dollar amounts here are four years out of date, but the relative values have been consistent over time, about $2,200 in annual health-care costs. If I don't even participate in the health-risk appraisal (HRA), my costs are higher, about $3,000, one of the reasons being there is an inclination that if people know that they're not living a healthy lifestyle, they're not going to want to admit it to anybody, including themselves, so they don't participate. I'm medium risk. On average, I'm about $3,500, which is about 57 percent more than the low-risk category. There's the threshold. If I can start to embrace and sustain a healthy lifestyle, on average could I potentially save PWC and maybe myself 57 percent per year in my health costs? Maybe. Finally, the high-risk category spends about $5,500 a year, or 151 percent higher than the low-risk group.

What are we seeing? We've seen that when people make changes that are sustained in their lifestyles and move from category to category, we do not realize this degree of savings. What we do see is those people who were medium-risk and moved to the low-risk category typically save 35 percent to 37 percent a year in health-care costs. Similarly, someone with the high-risk group moving to medium-risk saves 35 percent to 37 percent in health-care costs. There's a smooth, linear relationship there. The reason those savings are less than the potential here is I think those people who make the effort to move to the lower category probably were at the low end of this group to begin with and were in better health to start. While the savings are not as great as what we see here, they are still significant. The idea is first to get them there and then to sustain it.

A few years back I lost about 30 pounds and got pretty close to my driver's license weight. I've since put that 30 pounds back on, and that goes to some of the comments that were made here earlier. It's difficult to sustain this. I have to want to do that. That is a key. Three-plus years of participation in the health-risk assessment is a good starting point to encourage people to maintain that healthier lifestyle. I'm not going to spend any time on this chart. You've got it. You can look at it. This breaks it out more as an incremental cost by number of risk criteria. The same type of idea exists for excess disability costs.

Here's something that's interesting. One of the more involved types of health-risk assessments put things together on a wellness score basis, zero to 100, and usually relates to a few more questions than the dozen or so that we've looked at here. What a great linear relationship we're seeing here (see Plante slide 11). For each point on the wellness score that you gain, on average you save about $56 per year in health costs, and this is a 2003 study. It's still not up to date, but pretty close.

As you get people to look and understand—employees understand this—they have a vested interest to try to start to gain this. What incentive do we give employees as employers to get them to want to do this? It's one simple thing. It's money. Nothing else is as successful as money to get employees to want to change. How do you give them the money? Here we talk about the consumer-directed side, and in those types of plans it's additional dollars put into whatever alphabet soup account they're providing: HRA, health status adjusters (HAS), SSA, it doesn't matter, but some sort of funding in that account as a reward.

And $56 doesn't sound like a lot, and for whatever reason employees don't look at that as just $56. They look at that as a wealth, a reward for being successful. This does not have to be an expensive prospect for employers to promote. What they do need to do, though, is promote this regularly. How many of you have open enrollments each year where you get a wealth of information about your health plan choices, and then for the remaining 11 months you see nothing? Please be honest, even the people at the health plans. It seems that a third of the people here are raising their hands. We can't continue to do that. This has got to be an interactive, consistent educational program. You want people to be reminded

constantly of the need to maintain a healthy lifestyle. Health-risk assessments over the course of the year are one way to do so.

Change in costs follow change in risks. I think this ties a little more closely with that 36 percent savings that I talked about before. As you get people to reduce their risks in the long term, they will provide the employer, and ultimately themselves, with some savings. I just moved to the suburbs; I just got a four-bedroom house, too. I live about a mile from the train outside of Chicago now. I'm going to get some physical activity by walking to the train every day, twice. That, in and of itself, is not a lot of activity, but if you picked up my briefcase, you'd see that there's going to be a considerable effort on my part to be carrying that ton of bricks every day. That exercise will contribute greatly in my case to turning around some of my unhealthy lifestyle. I'll lose some weight. I'll get better exercise. I could find within a year or so that I am falling back into that low-risk category and ultimately, the weight on my driver's license.

Let's discuss cost savings associated with these programs. This is based on a study that Dr. D.W. Edington has done at the University of Michigan. I would strongly encourage you to look up on the Internet any work that he has done. There's a wealth of information out there. The guy has produced some great, long-term analyses around lifestyle, predictive modeling and savings to employers. I think the Health Management Research Center, where he's been tracking this, has 20 years of data now. It's fairly credible, I believe. What he's shown is that if you have zero or one health-risk assessment participation, I do it this year or not and that's it, chances are I'm going to have a trend of about 12.6 percent over time. However, if I'm participating in my health-risk assessment year over year, he has found that that trend is significantly different for those people.

There are savings to be realized there as you get people to participate in just a health-risk assessment, and it is a multiple-stage thing. First you take the assessment. Your particular lifestyle issues are identified, programs are established for you, and you join those programs. You follow and complete them. You get different rewards each step of the way. But it's that approach that provides employers with a fairly easy way of getting employees involved without feeling they're being forced into doing so. It's their choice. They can participate or not. Participation is sensitive to incentives.

I've got four examples of companies that have put in some of these programs. I'm not going to go into the details here, but if you look at some of the dollar amounts here, $25 in cash, big deal. It's $60 to $84 in savings per year on health insurance costs for the employer, single coverage. It's about $180 to $300 for family. These are not big dollar amounts. That's all it takes to get employees to want to participate. There is considerable ROI for the employers in this space.

What do we do? It's important for the employers to understand their employees. You want as a success metric 70 percent of your population at the low-risk

category. If you're at the 60 percent level, you've got something to shoot for, and through these programs you can get there over time. Probably a three-year horizon is an appropriate benchmark to try to get to those extra 10 points, and I say 60 percent not because I'm making that number up. That tends to be where a lot of organizations are today. About 60 percent of their people are in that low-risk group. A secondary success metric is 60 percent to 80 percent participation each and every year in the health-risk assessment. You want risk reduction. That boils down to it. Benefits follow risks. If you reduce your number of risks, you reduce the cost of the benefits. It's pretty obvious. The better the program, the better the benefits that you, the employer, and you, the employees, will receive as a result of this.

What are the elements that the employers put in place for employees? There is a lot of emphasis on Web sites because this is something that's available 24/7, that the employee and the employee's dependents can use to access and track their health conditions. They can set goals for themselves. They can get their rewards for participation in these types of programs. Newsletters are not as effective, but they are also in use. I think the health risk appraisal is the key one right now. It's where most employers are going. I've seen the most success with those thus far. We're not seeing a lot of screening yet. I think employers are dancing around that because of Health Insurance Portability and Accountability Act of 1996 (HIPAA) regulations. They're not doing a lot of in-house screening of employees. Health management coaching is a follow-up to what comes out of the health-risk appraisal. I weigh too much? Let me talk to a health coach and have him or her guide me in the right program to get me to lose weight. A health advocate is similar to a health coach but is an onsite person.

I think preventive services in health-care plans are pretty much the norm these days. The issue and problem I have with those is that these tend to be first-dollar coverage benefits. They're free benefits for the employees. Preventive coverage is covered 100 percent. Maybe there's a $10 co-pay. So what? Fewer than 40 percent of employees take advantage of this. That's abysmal. If this is free, why aren't 80 percent to 100 percent of employees taking advantage of preventive services? What employers are trying to do is boost that rate, and we're seeing that health-risk appraisals are getting them there. It's not getting to 60 or 70 percent, but it's getting them to about 50 percent to 55 percent. It's a start. Disease management is another discussion. Cost-efficient incentives are available. Like I said before, you don't need to spend a lot to get employees interested in trying to self-monitor their lifestyles. With that, I believe we're going to set up for questions.

MR. SANDLER: I want to thank Tom, Dan and Chris for their presentations. That was fascinating. We're open for questions now, and I'll start with the first question to Dan. When you talked about savings emerging, how long do you think it takes for real savings to start to emerge from an employer's point of view? That's often been an impediment for employers adopting these programs. They just see the ROI as taking too long.

MR. PLANTE: I think what we're seeing is a three-year horizon is where you start to get the full impact of the savings. That comes into play in one industry versus another. If you've got a high-turnover industry, fast food is a good example, employers are going to be unwilling to put in any programs where they're not going to see any return on their investment for three years when their people will be long gone. Other industries have a low turnover. I'll use the auto industry as an example. Companies tend to be more interested in these types of programs because they know they're going to hang onto their employees for a long enough period to realize the savings. I think three years is when you start to see savings.

MR. SANDLER: I have another question for Chris. Regarding the analytics that you talked about, are there particular ranges of group size where you think this is the most practical, or I should say most effective, to do the kind of analytics that you're talking about where you're trying to find out data on specific individuals?

MR. STEHNO: Sure. I think when you get to the large group size, 500 and above, your experience will probably take over, more so than what these data would do. Below that, in the midsize marketplace, it's excellent. In the small group, individual marketplace, it's good, but it may be bound a little bit more by regulations or people's willingness to use these data to underwrite someone as an individual.

FROM THE FLOOR: Chris, maybe related to that question, can you give some sense of what it costs to obtain the lifestyle-based analytics?

MR. STEHNO: I should have mentioned that. One of the big advantages of it as compared to data that people are used to purchasing, such as MIB or Rx data, those go about $10 a head. Lifestyle-based data are going to probably start at about 10 cents a head and go down from there depending on how many names you're purchasing. A couple of the clients I work with are probably spending about a penny per name to get the fields of data. You can purchase 400 fields of data for about 25 cents. For modeling purposes, we'll probably use about 50 of those fields, and you can, like I said, get that for under 10 cents a name.

FROM THE FLOOR: Are there particular organizations to obtain it from?

MR. STEHNO: What's changed in the industry a lot is about three or five years ago, if I were to do this, I'd have had to go to about 10 different places, shops, to get all these data, and I could get about 100 fields of data for $5. Big data aggregators have formed now. Some of the names you may be familiar with are Experion, Axiom and Info USA. They've gone out and consolidated all the data. Now all the Joe Smiths are already lined up. That saves me a lot of time and work in having to try to aggregate these databases and also in consolidating all these data in one place. There's been a huge price war, which has brought all these data down. If you're interested, shoot me an e-mail, and I can give you the list of some of the names of these data houses.

FROM THE FLOOR: I have two questions about BMI. What do you think of it as a measure? In some ways it looks as though it could be deceptive based on people who don't carry much abdominal weight, because it seems that that's what it's trying to measure. You two seem to differ. The first two speakers seem to differ on your opinions of use of BMI. Dr. Kravis, you seem to rely heavily on it, whereas you seem to think it wasn't all that helpful.

MR. STEHNO: Were you referring to me saying it's not helpful?

FROM THE FLOOR: Yes.

MR. STEHNO: Oh, no, I think it is helpful. We don't use height and weight in particular from the Department of Motor Vehicles. First, you cannot get it anymore. For the last couple of years we have had to use historical. second, it's a terrible measure on your driver's license. I'm a perfect example, as well. We infer height and weight, though, through the minivan example or other things. We think obesity is huge. We're trying to measure it. We just don't use height and weight. The other way we stay away from it, if we can get it from a source. We think that it is HIPAA data or leaning toward HIPAA data. The models we build for the most part, unless you want us to combine it with a medical model, are HIPAA-compliant. We don't have to get permission from anyone to use any of these data. We don't pull that. It's just inferred through other sources. But, yes, it's important.

DR. KRAVIS: You had another part of the question with BMI.

FROM THE FLOOR: There are some people who cannot be carrying much abdominal weight, but by BMI they're noted as being overweight or borderline obese.

DR. KRAVIS: Yes, the abdominal size is not as well-established as an indicator of risk. It is used. In combination with BMI, it's useful. Also, the BMI is age- and BMI-sensitive. Below 24, it's less sensitive. Above 30 to 35, it's even more sensitive. At the higher levels, the obese and obese, it has high predictive value.

MR. JOHN HEINS: Dr. Kravis, I wanted to clarify the second bullet point on your summary slide. It seemed to me to be contradictory to an earlier point that you made. It said, I think, that combined lifestyle changes showed a temporary gain, whereas I thought that you'd said earlier that combined lifestyle is the one that worked. Was the difference between those the reference to morbidly obese people?

DR. KRAVIS: The difference is the combined styles work, but for many patients, they cannot be sustained. they do work three, five or even 10 years, but most of the people or many of the people return to their previous weight or they regain weight. Witness one of the speakers today. It's a common phenomenon.