

DM DISEASE MANAGEMENT ADVISOR™

Do they work, and do they deliver an ROI?

Incentives: Experts weigh the expense against the effect of improved participation

In increasing numbers, employers and health plans are experimenting with the use of incentives to boost participation rates in DM and wellness programming. Although there is no question that incentives in the form of cash, reduced healthcare premiums, gift cards, and other items of value can indeed boost engagement in such programs, less clear is whether payers can expect any lasting clinical effect from the approach, or even whether incentives can ultimately pay for themselves in reduced medical utilization.

Plenty of policy experts and consultants are firm believers in the approach. In fact, many believe that incentives are absolutely essential to any well-intentioned effort toward population-based management. However, with much of the financial data around

incentives open to interpretation, there are also skeptics, noting that payers interested in using the approach for the purpose of controlling healthcare costs are right to consider incentives with a critical eye. To take a closer look at incentives, **DMA** connected with healthcare professionals on both sides of the issue.

“We live our entire lives based on incentives. They may not be financial incentives, but there are certainly social incentives, cultural incentives, and educational incentives.”

—Michael Parkinson, MD, MPH

Simple incentives are not enough

“We live our entire lives based on incentives,” says **Michael Parkinson, MD, MPH**, president of the American College of Preventive Medicine and former executive vice president and chief health and medical officer of Alexandria, VA–based Lumenos, a subsidiary of WellPoint. “They may not be financial incentives, but there are certainly social incentives, cultural incentives, and educational incentives.”

Consequently, Parkinson doesn’t understand why the notion of incentivizing behaviors to align with desired outcomes is so controversial in the realm of healthcare. In fact, he believes that all of the incentives built into the third-party payment system are totally misaligned with what most people traditionally want from healthcare: good health and reduced expenses.

Intent on coming up with an alternative approach, Parkinson became one of the chief architects of the consumer-driven model offered by Lumenos—a model that relies heavily on incentives to get members to fill out health risk assessments (HRA), engage in appropriate DM programming, and utilize cost-efficient care.

He explains that in the Lumenos plan, preventive



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The program has been put to the test in a randomized controlled trial, and efforts are under way to duplicate the approach.

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A new study questions whether an alternative approach to HIV screening might be more effective at diagnosing and preventing new cases than the approach recommended by the CDC.

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care is covered 100%. For additional healthcare services, funds are set aside by the employer in health savings accounts (HSA). That, in and of itself, is an incentive to spend more wisely, he says, because people see that money as their own. If there is money left over in the account at the end of the year, that money is rolled over into the funds set aside for the following year's health-care spending.

"It really gets someone's attention when they see that Lipitor is \$120 per month along with a \$20 copay, and lovastatin is \$17 per month," he says. Similarly, he

points out that people stop using the ER for primary care when they see the fees being deducted from their accounts, and they become more discriminating on the basis of quality in selecting their providers.

In addition to the HSAs, Lumenos members receive \$50–\$100 each year to fill out an online HRA that, upon completion, immediately connects them with a health coach to discuss their risks. Parkinson explains that the financial incentives boost participation rates in the HRA process by 35%–75%. In addition, members who need to work on tobacco cessation or weight-management or members who are chronically ill receive additional incentives to participate in appropriate interventions for those issues.

Why all the incentives? Parkinson explains that a simple, one-time incentive is not enough to produce sustained behavior change. "The industry likes to look at one incentive in isolation, and then calculate the ROI, but that doesn't make sense clinically," he says, noting that behavior change requires a more comprehensive strategy.

Parkinson acknowledges that he does not have data to show that the Lumenos approach produced specific outcomes or risk changes within a specific employer group. However, he points out that employers using the Lumenos health plan, with incentives, for their entire work force have seen their total healthcare costs remain flat, or close to baseline, for two consecutive years.

Nonincentive factors matter

Ramsay Farah, MD, MPH, the chief medical director of medical management at Hunt Valley, MD–based Health and Medical Solutions, a division of Nationwide Better Health, agrees that incentives can make a big difference in participation rates, but from a study he conducted of his company's entire book of business, he concludes that the way they are implemented is critically important.

"For people to participate, you can't just wait until they finish [the program], and then give them money.

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You have to give them something up front to get them motivated," says Farah. In addition, he indicates that there are certain thresholds you have to meet to make a significant effect. "We found . . . that if the incentive is less than \$66, it is much less likely that you will get [much of an] effect on participation."

By their medical nature, some programs require a different approach than others, he adds. For example, although most healthcare organizations identify people for intervention through claims, that strategy does not work well with maternity management programs. "With maternity, by the time you find out [through claims] that someone is pregnant, you have already missed a golden opportunity of getting them in the first trimester," says Farah.

Consequently, he recommends instituting a tiered incentive program whereby women who self-refer into the program in the first trimester will receive a much larger incentive than those who contact the program in

the second trimester. "Then, if the woman comes into the program in her third trimester, she would not receive any incentive to start, but she would be eligible—along with all the other participants—to receive an additional incentive when she completes the program," he says.

Whereas Farah found incentives to be powerful, he also found that a number of other factors are critically important to insuring the success of an incentive program. "You need a commitment and a culture from senior management that is expressed to the employees that this [health initiative] is something of a priority to the organization," he says.

Further, he emphasizes that the employees must trust that information that they share with any DM or wellness program will be confidential. Otherwise, he says, employees will be afraid that their information, or even their participation in a DM program, will adversely affect their employment.

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Incentives: They're not just about participation anymore

How do you determine whether to integrate incentives in your health management strategy? The answer is in your data, according to **Sue Lewis**, senior vice president of health and productivity solutions at Lyndhurst, NJ-based IncentOne. "If you can't get your population engaged in a program above 30%, that is generally an indicator that you might want to consider an incentive," she says.

Once they decide to offer an incentive, Lewis advises companies or health plans to get input from the population, perhaps through focus groups or surveys, about what type of incentive would be well received. In addition, she points out that the incentive should be a good fit with the priorities and culture of the organization. "Generally, what we come down to at the end of the day is a very limited design of options which includes cash or gift certificates, which are very prevalent," she says. "And, of course, medical premium discounts aligned with overall medical management cost models."

Lewis says incentives of \$50–\$100 are generally effective in driving individuals to do simple activities associated with

their health, such as filling out a health risk assessment. A bigger commitment, such as that required for participation in a DM program, will probably require a larger incentive. "You have to have enough of an incentive to motivate individuals over an extended period of time in engagement," she says. "And \$250 per year is generally pretty sufficient for most groups, and \$500 would be very sufficient and motivational for almost any group you are putting an incentive out there for."

One new trend involves aligning incentives with value-based purchasing, says Lewis. For example, employees are being rewarded for using premium networks, decision-support programs, and other resources that show they are making informed decisions regarding their health. "We are continuing to reinforce healthy behaviors . . . with incentives, but we are also now being asked by employers to design programs that drive people to tools and resources that foster strong consumerism skills, and get them more engaged in their healthcare purchasing," she says.

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Farah agrees with Parkinson that a simple, one-time incentive will not have much effect in producing behavior change. However, Farah concludes from his study that a well thought out, longer-term strategy will ultimately save money.

Long-term effect is an open question

Not everyone is convinced that implementing incentives is a good idea. Although acknowledging that incentives can boost participation in DM and wellness programming, **Ian Duncan, FSA, MAAA**, president of Solucia Consulting, Inc., an actuarial firm based in Hartford, CT, says he is skeptical that they can deliver an ROI.

"You are dealing with [DM] programs that are not able to save large amounts of money to start with. And if you then incentivize large numbers of people to participate in the programs—especially if you give them large incentives—you destroy the economics," he says.

In fact, one trend that mystifies Duncan is the move by many employers away from DM approaches that have demonstrated small, but real, savings toward wellness programming where they are instituting all kinds of incentives to boost participation. "I don't think there is any chance of demonstrating a financial return [with these programs] for at least the first few years," says

Duncan. "Clearly, you want your employees to reduce their risks, be more compliant, and take control of their health . . . so it is a good thing to do," says Duncan. "But whether it is a good thing to give every employee \$500 to do it, though, I think is a question we should ask ourselves more."

A better approach, at least from an economic standpoint, according to Duncan, is to consider implementing disincentives, such as higher premiums or higher deductibles, for employees or health plan members who do not participate.

"It is more valid economically because you don't have all this extra cost that the employer has to pay out of pocket to get a lot of people to participate in the program. It can be cost-neutral if you structure it correctly," he says. "These sorts of designs seem to be getting more prevalent. There is a lot of interest in them at the moment."

Duncan acknowledges that it is possible that incentives, implemented in year one, may produce positive financial returns a few years down the road. "If an employer is going to invest in health today, we look at what happens in the next year or so—whether there is a payback. And the answer is generally not enough to pay for the incentives," says Duncan. "However . . . even though there isn't a payback today, there may be in five years' time." ■

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Investigators put model to the test in an inner-city population

Family-based intervention produces solid outcomes in tackling childhood obesity

Many experts agree that the most effective route to curbing the epidemic of obesity in this country involves tackling the issue among children—before unhealthy habits and lifestyles become entrenched. However, as with weight management programming geared toward adults, it is hard to find scientific evidence that a particular strategy or program designed for children actually works over the long term. And the challenge of finding a solution to this problem is even greater when you consider that pediatric obesity is most prevalent among minority and disadvantaged populations.

Still, enough people are working on this issue that viable approaches to the problem are beginning to emerge. One such methodology is a program developed at Yale University in New Haven, CT, that utilizes an educational process to gradually produce positive lifestyle changes in youngsters and their families.

In a one-year, randomized controlled trial that compared the effect of this program, called Bright Bodies, with a more traditional, clinic-based approach to weight management, the Bright Bodies program produced a range of clinical improvements regarding key metrics including body mass index (BMI), whereas such values among control group participants actually worsened.

Although the results of this groundbreaking trial were just published in the *Journal of the American Medical Association (JAMA)*, the lead author of the study, **Mary Savoye, RD, CD-N, CDE**, recently provided a more in-depth discussion of what the critical components of the Bright Bodies program are, what costs are involved, and how the approach might be successfully duplicated elsewhere.

Obesity: A major pediatric challenge

Savoye spoke at a news conference scheduled to coincide with publication of *JAMA*'s June 27 issue,

which was devoted entirely to issues related to chronic disease in children. Although it is not entirely clear how many children suffer from chronic disease, **Catherine DeAngelis, MD, MPH**, a coeditor of the issue, noted that the best estimate is that 15%–18% of children have at least one chronic condition. “It is a very substantial problem,” said DeAngelis. “A chronic condition in a child will become a chronic condition in an adult. You just know that. And what you are talking about for adults is maybe 10 or 20 years of suffering. With a child, you are talking about 50 and maybe even 60 years of suffering.”

A large number of these cases are directly linked to the dramatic increases in childhood obesity that have occurred during the past four decades. Citing statistics from the *National Health and Nutrition Examination* survey and the Centers for Disease Control and Prevention (CDC), Savoye noted that in 1963, only 4% of six- to 11-year-olds and 5% of 12- to 19-year-olds were considered overweight or obese. “Today we are at 19% and 17%, [respectively]. And if we were to isolate this group and look at minorities, this percentage would be as high as 26%,” said Savoye, indicating that the problem represents a major pediatric health challenge.

The effect of childhood obesity is particularly apparent in the increasing prevalence of Type 2 diabetes among youngsters. “Years ago, Type 2 diabetes was diagnosed at age 40. Now children are being diagnosed at 15 to 16 years of age,” said Savoye.

Family involvement is critical

Noting that it is clear that the traditional approach, involving infrequent visits to a clinic for counseling and education, has not proven effective in addressing the problem, Savoye and colleagues set out to investigate whether a higher-intensity program—including supervised physical

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activity, nutrition counseling, and psychosocial support—would deliver clinically significant returns in an inner-city population of children in New Haven, CT.

Participants in the study had to be eight to 16 years of age, and they had to meet the CDC's definition of overweight, which involves having a BMI greater than the 95th percentile. In addition, there had to be a care-

giver willing to participate in the program with the child. Children who met the study criteria were then randomized on a two-to-one basis, either to the Bright Bodies weight management group or the control group, which would receive traditional care. Ultimately, 105 children were randomized to the intervention group, and 69 were randomized to receive traditional care.¹

Figure 1: Changes in body composition, cardiovascular, and insulin-sensitivity parameters for weight management and control groups at six and 12 months*

Outcome	Month	Mean (95% confidence interval)		Treatment Effect (intervention – control) †	Between-group P Value
		Weight management group	Control group		
Weight, kg	6	-2.6 (-4.2 to -0.9)	5.0 (2.9 to 7.2)	7.6 (4.3 to 10.8)	< .001 ‡
	12	0.3 (-1.4 to 2.0)	7.7 (5.3 to 10.0)	7.4 (4.2 to 10.6)	< .001 ‡
BMI	6	-2.1 (-2.6 to -1.5)	1.1 (0.4 to 1.8)	3.1 (2.1 to 4.2)	< .001 ‡
	12	-1.7 (-2.3 to -1.1)	1.6 (0.8 to 2.3)	3.3 (2.1 to 4.3)	< .001 ‡
Body fat %	6	-3.2 (-4.3 to -2.1)	2.0 (0.6 to 3.5)	5.2 (3.5 to 7.0)	< .001 ‡
	12	-4.0 (-5.2 to -2.8)	2.0 (0.5 to 3.5)	6.0 (4.2 to 7.8)	< .001 ‡
Estimated body fat mass, kg	6	-4.1 (-5.7 to -2.6)	4.4 (2.2 to 6.5)	8.5 (5.7 to 11.3)	< .001 ‡
	12	-3.7 (-5.4 to -2.1)	5.4 (3.2 to 7.8)	9.2 (6.4 to 12.0)	< .001 ‡
Blood pressure, mm Hg					
Systolic	6	-2.2 (-4.6 to 0.3)	0.3 (-2.7 to 3.2)	-2.4 (-1.8 to 6.6)	.25
	12	-2.0 (-4.4 to 0.3)	-0.4 (-3.7 to 2.9)	-1.6 (-2.6 to 5.8)	.45
Diastolic	6	-1.7 (-3.8 to 0.4)	1.9 (-0.8 to 4.7)	-3.6 (-0.3 to 7.5)	.07
	12	1.4 (-0.8 to 3.6)	2.8 (-0.4 to 6.0)	-1.4 (-2.5 to 5.3)	.47
Cholesterol, mg/dL					
Total	6	-7.5 (-12.3 to -2.7)	1.5 (-4.7 to 7.6)	-9.0 (-0.09 to 18.0)	.05 ‡
	12	-9.2 (-14.8 to -3.5)	3.7 (-3.9 to 11.3)	-12.8 (3.8 to 21.9)	.005 ‡
HDL	6	2.2 (0.3 to 4.2)	0.0 (-2.4 to 2.5)	2.2 (-5.8 to 1.4)	.23
	12	3.2 (1.3 to 5.2)	1.4 (-1.4 to 4.2)	1.8 (-5.4 to 1.8)	.32
LDL	6	-3.3 (-7.2 to 0.7)	2.0 (-2.7 to 6.7)	-5.3 (-1.6 to 12.2)	.13
	12	-2.4 (-6.9 to 2.2)	1.5 (-4.8 to 7.9)	-3.9 (-3.0 to 10.8)	.26
Triglycerides, mg/dL §	6	-17.9 (-25.3 to -9.9)	-4.2 (-16.0 to 8.5)	-13.7 (-3.6 to 33.9)	.12
	12	-21.3 (-28.4 to -13.6)	-8.1 (-20.9 to 7.4)	-13.2 (-2.3 to 4.1)	.11
Fasting glucose, mg/dL	6	-2.2 (-3.8 to -0.5)	-1.3 (-3.5 to 0.9)	0.9 (-2.3 to 4.1)	.57
	12	-3.4 (-5.2 to -1.8)	-1.8 (-4.3 to 0.8)	1.7 (-1.5 to 4.9)	.30
Fasting insulin, µU/mL §	6	-6.5 (-8.2 to 4.5)	1.7 (-1.6 to 5.7)	8.2 (3.9 to 10.0)	< .001 ‡
	12	-6.1 (-8.1 to 4.0)	4.5 (0.2 to 9.6)	10.6 (5.7 to 12.1)	< .001 ‡
HOMA-IR §	6	-1.51 (-1.92 to 1.06)	0.33 (-0.43 to 1.22)	1.84 (0.85 to 3.10)	< .001 ‡
	12	-1.52 (-1.93 to -1.01)	0.90 (-0.07 to 2.05)	2.42 (1.29 to 3.76)	< .001 ‡

Abbreviations: BMI, or body mass index, calculated as weight in kilograms divided by height in meters squared; HDL, or high-density lipoprotein; HOMA-IR, or homeostasis model assessment of insulin resistance; LDL, or low-density lipoprotein.

SI conversion factors: To convert total HDL and LDL cholesterol to mmol/L, multiply by 0.0259; triglycerides to mmol/L, multiply by 0.0113.

* Control group (n=69) and weight management group (n=105 at six and 12 months).

† Treatment effect defined as the change in the weight management group—the change in the control group.

‡ Statistically significant difference between changes in weight management and control group.

§ Data are presented as geometric means (95% confidence intervals).

Source: Savoye M., Shaw M., Dziura J., et al. "Effects of a Weight Management Program on Body Composition and Metabolic Parameters in Overweight Children." JAMA 2007.

Interestingly, investigators also initially intended to further randomize the intervention participants toward two different nutritional approaches: one that involved a dieting group and one that focused on educating families about healthy food choices. However, Savoye noted that it quickly became clear that the dieting approach was not working at all. “Most of the kids [in the dieting group] dropped out. At the six-month mark, we only had five or six participants,” she said, noting that at this point, investigators abandoned the dieting approach altogether, and siphoned all of the intervention participants toward the healthy food choices intervention.

The overall goal of the healthy food approach was to encourage entire families to make better food choices. Consequently, both caregivers and children in the intervention group were required to attend a 40-minute nutrition class, facilitated by a registered dietitian, once per week. “You would be surprised how many families feel that everybody in the family should be eating differently than the overweight child,” noted Savoye. “So, we really worked on the concept of getting everyone in the family to eat healthy together.”

Intervention includes fitness & emotional support

In addition to the nutrition component, the children in the Bright Bodies group also attended supervised exercise classes twice per week for 50 minutes. Participants were grouped according to age, and Savoye emphasized that program developers tried to incorporate games, relay races, and other activities that would be enjoyable. “The goal . . . was to instill a sense that exercise can be fun for these kids, and that it is critical to the weight-management equation,” she said, noting that the kids were also encouraged to exercise for three additional days on their own. All the kids wore heart rate monitors during these sessions so that staff members could ensure that they were working at 65%–85% of their maximum heart rate.

A third component of the Bright Bodies program involved 40-minute sessions, once per week, that focused on behavior modification. The sessions were facilitated

by either a registered dietitian or a social worker, and Savoye explained that there were separate classes for parents and children.

At the end of six months, the Bright Bodies group shifted to a maintenance phase, where the various classes decreased from biweekly to bimonthly for the final six months of the study. Alternatively, there was no change in the care provided to the control group. “They came in and received a medical assessment, diet and exercise counseling, and brief psychosocial counseling by our social worker,” said Savoye, noting that the families were asked to increase their physical activity and decrease their sedentary activity.

Intervention delivers positive outcomes

A significant number of participants in the intervention program dropped out before the end of the one-year study period. Of 105 participants, only 75 completed the program. From follow-up discussions with some of these individuals, Savoye indicated that transportation was a big problem for many of the families. “Also, we found that a lot of people just didn’t realize what kind of commitment we were talking about. It sounded good to them at the beginning, but to come in twice a week I think was very hard for them,” she said. However, there was also a high dropout rate in the control group, even though the commitment was far less in that arm of the study. Of 69 participants, only 44 completed the study.

Despite the problem with dropouts, investigators found that the Bright Bodies group significantly outperformed the control group on a range of indicators (see **Figure 1** on p. 90). For example, while the Bright Bodies participants were able to, on average, maintain their baseline weight at 12 months, control group participants gained an average of 7.7 kg. This correlated to reductions in BMI for the Bright Bodies group and increases in BMI in the control group.

Similarly, there was a 20-lb difference in body fat, on average, between participants in the two groups, with intervention group participants decreasing the percentage

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of body fat in their bodies whereas that percentage was increasing in control group participants.

There was not much difference between the two groups with respect to cardiovascular outcomes, such as lipid levels and blood pressure, but investigators found significant differences in insulin resistance, as measured by the homeostasis assessment model for insulin resistance, or HOMA-IR. Using this measure, Savoye found that 57% of the participants in the intervention group and 59% of the participants in the control group had insulin resistance at baseline. "Out of that percentage, half of [the participants] in the treatment group had their insulin resistance resolved within the 12-month study period," said Savoye, but she noted that none of the control group members experienced similar improvement. In fact, she points out that 25 control group participants who did not exhibit signs of insulin resistance at the beginning of the study had developed insulin resistance by the end of the study.

Savoye indicated that she has good reason to believe that the positive results achieved in the Bright Bodies group will have lasting effect, noting that earlier pilot studies of the approach showed continuing benefits at two years. "My sense is that these kids will continue to do very well and that the secret is that it is an educational process," she said. "They can now make informed decisions about better food choices."

Investigators are now working on calculating the cost-effectiveness of the approach for a separate study, but considering that program developers received free use of a school facility to carry out the study and that they received some funding, Savoye calculated that program expenses amounted to about \$800 per child, per year to decrease BMI by 1.7 units. "With rent, the program will cost more, but I think this is a very economical way to treat a child, and to make really good changes in health outcomes. It is affordable," she said. ■

Future focus on cost, dissemination

The randomized trial lasted for only 12 months, but

Reference

¹Savoye M., Shaw M., Dziura J., et al. "Effects of a Weight Management Program on Body Composition and Metabolic Parameters in Overweight Children." *JAMA* 2007; 297:2697-2704.

Predictive model focuses on morbidity

New program quantifies risk in terms that get attention

Although health risk assessments (HRA) are an important tool in determining the overall risk profile of individuals as well as populations, most healthcare policy experts agree that simply administering an HRA, without any follow-up interventions, will have little effect on modifying that risk. However, BioSignia, a healthcare technology company based in Research Triangle Park, NC, contends that when HRA data are translated into meaningful and actionable information for the individual, the HRA process can produce a positive effect on clinical and financial outcomes.

In fact, BioSignia has developed a risk-prediction model designed to do exactly that. The tool, called Know

Your Number (KYN), uses a process that the company calls synthesis modeling to quantify an individual's risk of developing chronic, preventable, obesity-related diseases such as diabetes, chronic obstructive pulmonary disease, and heart disease. In addition, KYN calculates what modifiable factors are contributing to that risk so that individuals can take steps to improve their overall risk profile.

The approach has attracted a diverse range of customers, ranging from life insurance companies interested in obtaining more accurate risk-prediction models to health plans and employer groups focused on controlling spiraling healthcare costs by reducing risks. In addition, new applications of KYN are being offered directly to the

consumer with the idea that motivated individuals will act on the data—even in the absence of provider recommendations or formal wellness interventions.

Program takes a direct approach

Since its founding in 1996, BioSignia has focused on developing predictive applications that can be applied to healthcare and health-related outcomes—especially morbidity outcomes—according to **Timothy Smith, PhD**, BioSignia's CEO. The company does this by using its proprietary synthesis modeling approach, which essentially synthesizes the research from many different evidence-based studies in order to develop multivariate disease risk-prediction models. "It took us seven years to develop our technology and to get it completely validated," says Smith. "We have been marketing [our programs] for about the past two years."

The company's flagship offering, the KYN program, begins by taking the user through an evidence-based clinical assessment that is similar to what a person might go through in the doctor's office, he says, noting that the assessment includes questions related to demographic data, family history, medical history, medications, and some basic lab values. "It is a very brief but targeted assessment," says Smith. "We are interested in getting to the point of being able to predict morbidity onset—the likelihood that [the individual] will have a disease within a given period of time."

This focus on onset of disease is a key difference between the KYN program and a traditional HRA, notes Smith. "Typical HRAs are really based on technologies that are focused on mortality or the likelihood of death occurring in a group of people who have the same kind of characteristics," he says. "And while they are often used to determine the general morbidity of the population, it is a very indirect way of looking at that."

KYN reports quantify risk

The clinical assessment or questionnaire that the patient or provider fills out on the front end of the KYN process can be accomplished in a number of different

ways, depending on the venue, says Smith. For example, in a doctor's office, the patient may begin filling out a form in the waiting room, but then a clinician may take over the process as the patient goes through a physical exam and undergoes various lab tests. In other settings, the data may be entered directly into a computer. However, in both cases, the data are ultimately sent electronically to the BioSignia server for analysis.

The result of this process is a report that quantifies a patient's risk of developing an array of chronic diseases. And this information is further broken down into components, including the percentage of risk that the KYN algorithms have determined is modifiable and how much of that risk is related to each one of the patient's risk factors.

The KYN reports can be used alone or in conjunction with targeted interventions, but in both cases, Smith notes that studies have confirmed reduced risks and lower healthcare costs. "We found that people who just [undergo] KYN with no intervention—their costs go down," he says, explaining that it is natural for people to share their KYN reports with their physician. "We think that is directly related to the fact that reports like this are very useful when put into the hands of a physician, and very communicative when given directly to the individual."

When groups of patients who underwent only the KYN assessment were compared with groups who underwent KYN and intervention, the intervention groups experienced greater reductions in risks and healthcare costs, but Smith points out that it is highly unusual for HRAs to produce any effect without follow-up intervention.

Risk estimates get attention

Employer groups with established health promotion programming are a key customer group for the KYN approach, according to Smith. For example, Springfield, OH-based International Truck and Engine Corporation first took advantage of KYN when the company launched a fitness initiative in January 2006, explains **Robin Bayer, MD**, the organization's medical director. The idea was

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Predictive model

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that employees could take the KYN assessment before and after going through the fitness program so that the results of that effort could be quantified. However, Bayer explains that the enthusiastic response from employees convinced the company to offer KYN to employees on an ongoing basis, with or without the fitness initiative.

“When employees see that they have a 31% risk of having an MI in the next five years, that gets their attention,” says Bayer. “It stresses their achievable [level of] risk, and tells them that if they change a particular risk factor, how they can affect their risk of disease.”

Taking the KYN assessment is completely voluntary for employees, says Bayer, but she points out that 490 individuals—representing about 40% of the work force—have completed the assessment at least once, which is a much higher participation rate than the company has achieved with previous HRA-based efforts. In addition, she has data showing percentages of change on key metrics regarding 100 employees who took the KYN assessment in 2006 and then again a year later. These employees lost an average of 5 lbs and reduced their waist circumference by an average of half an inch, says Bayer. In addition, she notes that the percentage of employees at their LDL target goal increased from 68% to 89%, and employees at their HDL goal increased from 76% to 90%.

Tracking capabilities appeal to executives

Kelsey-Seabold Clinic, a large multispecialty group practice based in Houston, started using KYN in 2003 in its executive health program in response to a growing demand from customers for the kinds of tracking capabilities that the program offers. “We would have people coming in with spreadsheets, and they would ask us to update them because they were tracking their cholesterol and [other health metrics],” says **Rebecca Leal**, director of corporate, executive, and wellness programs. Leal notes that the executive health program is designed to offer a higher level of service, including extensive

diagnostic capabilities and more time with the physician.

“What we liked about this was, unlike most HRAs, it doesn’t just rely on self-reported answers. It focuses on the medical aspects of the patient,” says Leal, explaining that the questions cover family history, medical history, and specific lifestyle behaviors.

Although Leal does not have any aggregate data to share, she indicates that there have been dramatic improvements in terms of clinical metrics, as well as risk reduction in a number of patients who have taken repeated KYN assessments over time. In fact, the program has been so well received in the executive health program, that Kelsey-Seabold is now offering it to employers as part of its off-site wellness program.

Although there are no current plans to offer KYN through Kelsey-Seabold’s network of PCPs, the organization is gearing up to offer the program directly to consumers via the company’s Web site. “People will be able to log on and purchase a KYN assessment,” says Leal, noting that people who have not had a recent physical will be able to come into the clinic to get the required measurements and lab work completed. “We will get their purchase order, put a KYN profile together, and then schedule a health coach session with them on the phone.”

Health plans are a hard sell

Currently, KYN users include health plans, DM companies, group practices, employer groups, and insurance firms, but Smith acknowledges that the program has been a harder sell to health plans than the other entities. “In general, the use of predictive modeling has not been as warmly received by health plans as it has been by DM companies or by employers. And a lot of that has to do with the fact that health plans tend to be more concerned with the people they have who are already sick rather than the ones who might soon be sick,” he says. “An employer or a physician is more motivated to head things off early and to address potential outcomes as soon as possible.” ■

Investigator believes alternative approaches offer significant advantages

Analysis sparks new debate about current HIV screening recommendations

When the Centers for Disease Control and Prevention (CDC) dramatically broadened its HIV screening recommendations in September 2006, many healthcare policy experts applauded the move, pointing out that roughly 250,000 Americans are unaware of their HIV status. And there is no question that a large percentage of these individuals are unknowingly passing the disease on to others. However, a new analysis of the revised recommendations—which call for opt-out HIV screening for all individuals aged 13–64, without the need for risk assessment or counseling—raises serious questions about whether a more targeted approach to screening that zeros in on high-risk groups and regions might be more effective.

In fact, the new analysis, by **David Holtgrave, PhD**, an expert on HIV prevention at the Johns Hopkins Bloomberg School of Public Health in Baltimore, suggests that for the same amount of dollars required to carry out the CDC's broad recommendations for opt-out screening, a more targeted HIV screening and counseling approach could identify more than three times as many HIV cases, and it could prevent four times as many new HIV infections as the CDC's strategy.

The provocative report, which appears in the June *PLoS Medicine*, has generated considerable discussion about the relative merits of various testing strategies. In fact, rather than opting for one strategy or another, many experts contend that the best approach may well involve implementing a number of different strategies simultaneously.

Targeted approach may offer dividends

Holtgrave, who used to head the CDC's division of HIV/AIDS prevention, decided to take a closer look at the CDC's new HIV screening recommendations because no one seemed to know how much an opt-out testing program would cost to implement nationwide and what the specific consequences of implementing such a program would be. "I thought it was really important to try and do some analyses to get a sense of those two issues . . . and whether there are other policies that might, perhaps, be even more effective or more efficient in trying to achieve the same ends," he says.

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Figure 2: Costs and consequences of four HIV testing or counseling and testing scenarios

Outcome	Basic case (opt-out testing)	Behavioral offset case	Routine counseling and testing case	Targeted counseling and testing case
Number of persons tested	65,520,000	65,520,000	65,520,000	29,868,308
Number of undiagnosed HIV+ persons reached	56,940	56,940	56,940	188,170
Number of high-risk HIV- persons reached	NA	7,649,048	7,649,048	14,636,964
Total program costs	\$864,207,288	\$864,207,288	\$1,419,250,220	\$864,207,288
Transmissions averted	3,644	3,644	3,644	12,043
Infections averted	Not relevant	(569)*	1,689	2,510
Transmissions and infections averted	3,644	3,076	5,333	14,533
Gross cost per transmission or infection averted	\$237,149	\$280,933	\$266,128	\$59,383
Public support needed for HIV care	\$961,335,502	\$961,335,502	\$961,335,502	\$3,176,937,598

* In this scenario, it is estimated that infections are increased by 569 rather than averted.

NA: not applicable.

Source: Holtgrave D. "Costs and Consequences of the US Centers for Disease Control and Prevention's Recommendations for Opt-Out HIV Testing." *PLoS Medicine* 2007; 4:e194

HIV screening recommendations

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Consequently, using basic methods of cost-effective analysis, Holtgrave considered four scenarios. First, he calculated what it would cost to implement the CDC's opt-out HIV testing strategy, a policy that calls for routine testing, but with the option for patients to decline. Then he considered the CDC's testing strategy with the added caveat (or behavioral offset) that, in the absence of any HIV counseling, a certain percentage of people who test negative for the virus might continue to engage in risky behavior, thereby eventually resulting in infections.

The third scenario that Holtgrave considered looked at what the costs and effect of routine HIV testing would be if everyone also received pretest counseling and risk assessment. And the fourth scenario considered the costs and effect of an HIV testing and counseling approach whereby high-risk groups, urban areas, and healthcare settings known to have populations with at least a 1% prevalence of HIV would be targeted for HIV screening and counseling. (See **Figure 2** on p. 95.)

What Holtgrave concluded was that for the same \$864 million that it would cost to implement the CDC's recommended opt-out testing program, a targeted approach that included both testing and counseling would be far more effective at both diagnosing new cases of HIV as well as averting new transmissions.¹

Risk-based screening presents problems

Given the dramatic differences between opt-out testing and targeted testing and counseling in Holtgrave's calculations, it is curious that a targeted testing and counseling approach is pretty much what the CDC had recommended for a decade before broadening its recommendations last fall.

However, those recommendations were never fully implemented—perhaps because the CDC never had an \$864 million budget for the approach, although Holtgrave points out that all of those funds need not come from public resources. Nonetheless, the CDC broadened its recommendations with the hope that

more providers and healthcare settings would implement HIV screening policies without a burdensome requirement for counseling, and that more people would benefit from being diagnosed earlier on in the course of the disease, according to **Bernard Branson, MD**, from CDC's division of HIV/AIDS.

"Our concern was that [the earlier CDC recommendations for targeted screening] were never implemented," says Branson. "The other issue is we have evidence from several studies indicating that targeting on the basis of risk misses about half the people who are HIV infected."

Branson also suggests that Holtgrave's conclusions with regard to the effects of HIV counseling may be overly optimistic. "To be effective, counseling has to be relatively structured, people have to be trained, and there has to be quality assurance," he says. "The question is whether that is feasible with a large group of providers in a variety of circumstances."

Prevention delivers cost-savings

Holtgrave acknowledges that funding has never been available to fully carry out either the targeted approach to HIV screening and testing he outlines in his study or the opt-out testing strategy recommended by the CDC. However, he emphasizes that policymakers should consider the huge savings that could potentially be achieved by preventing new infections and transmissions.

"It is very legitimate to say that for every infection averted, we save somewhere between \$200,000 and \$300,000 over the course of a lifetime, depending on whose paper you take from the literature as offering the best estimate of the cost of treatment," he says, noting that when you do the math, both the opt-out and targeted screening and counseling strategies outlined in his study are either cost-saving or very close to cost-saving. ■

Reference

¹Holtgrave D. "Costs and Consequences of the US Centers for Disease Control and Prevention's Recommendations for Opt-Out HIV Testing." *PLoS Medicine* 2007; 4:e194